DOCUMENT RESUME

ED 446 417 EF 005 624

TITLE	Natural Disaster & Crisis Management in School Districts and Community Colleges.
INSTITUTION	Florida State Dept. of Education, Tallahassee. Office of Educational Facilities.
PUB DATE	1997-06-30
NOTE	103p.
AVAILABLE FROM	State of Florida Department of Education, Education Facilities, 325 W. Gaines St., Room 1054, Tallahassee, FL 32399.
PUB TYPE	Guides - Non-Classroom (055)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	*Community Colleges; Elementary Secondary Education; *Guidelines; Posttraumatic Stress Disorder; *Public Schools; Two Year Colleges
IDENTIFIERS	*Disaster Planning; *Emergency Preparedness; Florida

ABSTRACT

This document provides school districts and community colleges in Florida with guidance on disaster preparedness planning and management for all types of disasters. Procedures include those for insurance coverage, emergency shelters, command centers and disaster team organization, emergency communications, security, preparation prior to disaster, damage assessment, extended use of schools as emergency shelters, emergency construction and restoration, and actions during and after a disaster event. Also included are issues and procedures dealing with Post Traumatic Stress Syndrome. Appendices provide sample forms, Florida Statute 235.26(9) Educational Facilities as Emergency Shelters, and the effects of hurricanes Andrew and Hugo. (Contains a 43-item bibliography.) (GR)

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Natural Disaster & Crisis Management in School Districts and Community Colleges

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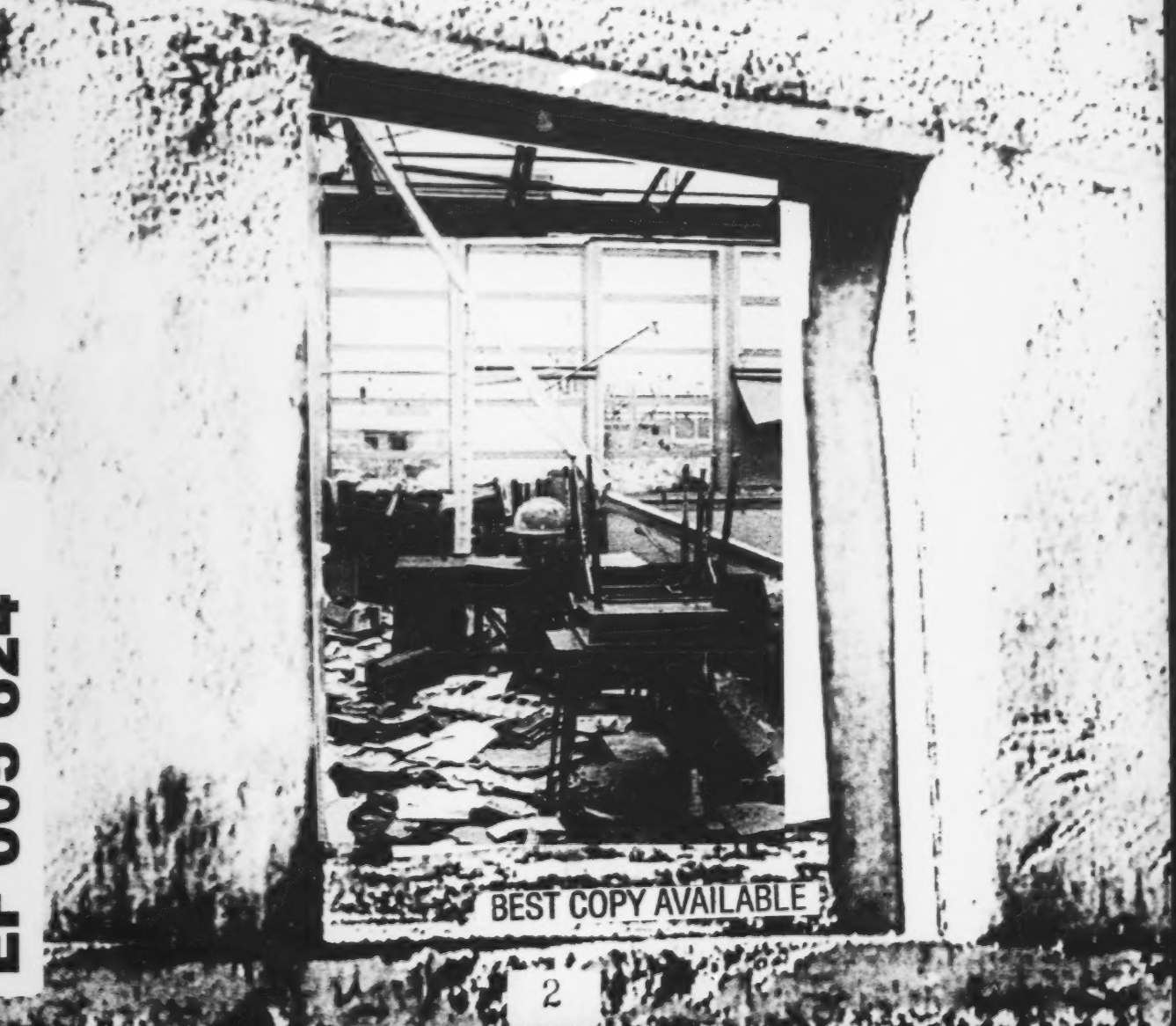

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INTRODUCTION

On August 24, 1992 Hurricane Andrew roared through southern Dade County, Florida. The results of the storm included 64 deaths, and the total destruction of 9,000 single family homes, 8,974 mobile homes, 10,719 apartments, more than 85,000 buildings, and 82,000 businesses. The storm left approximately 260,000 people displaced or homeless, 1.4 million people without electricity, and losses estimated at more than $25 billion.

The statistics, however, only begin to describe the actual disaster. The storm was an extremely powerful force four hurricane, and although major destruction was limited to south Dade County, the storm was large enough to literally level a small county. The press was not able to fully portray the immense amount of destruction. Dade County was disabled for more than two weeks, and the surrounding counties were heavily impacted by displaced persons and relief efforts.

The goal of this document is to provide a guideline for disaster preparedness planning and management, for all types of disasters, within, and among, school districts and community colleges. Management generally believes that a disaster will not happen to them, and fails to realize the impact a disaster will have on the organization.

Schools have a dual role in disaster preparedness. They must function as emergency shelters when called upon, and must be returned to an educational function as quickly as possible to secure a normal environment for children, parents, and staff.

Information for this document was gathered from many expert written sources and interviews over the year following Hurricane Andrew. It is hoped that this document will be a beginning point for a focused plan, which when managed efficiently, will minimize disaster losses.

The document is organized in outline form, by topic with subheadings. Many of the works listed in the bibliography can be accessed from the Florida Department of Education - Educational Facilities.

NATURAL DISASTER AND CRISIS MANAGEMENT
in
SCHOOL DISTRICTS AND COMMUNITY COLLEGES

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POSSIBLE DISASTERS AND CATASTROPHIC EVENTS

- **Definition**
  - Any natural, technological, or civil emergency that caused damage of sufficient severity and magnitude to result in a declaration of a state of emergency by a county, the Governor, or the President of the United States. (House Bill 911;252.34(1)
- **Classification**
  - Minor - Disaster that is likely to be within the response capabilities of local government. Minimal need for state or federal assistance. Example: tropical storm, local flooding
  - Major - Disaster that is likely to exceed local capabilities. Requires a broad range of state and federal assistance. Example: category one to three hurricane.
  - Catastrophic- Disaster that will require massive state and federal assistance, including military involvement. Example: Category four or five hurricane that hits a densely populated area.
- **Identify areas of vulnerability and past history of different types of disasters including**
  - Projected storm surges by hurricane category
  - Past hurricane occurrences
  - Past tornado events
  - Past flood events
  - History of freeze
  - History of droughts
  - History of civil disturbance
- **Hurricane**
  - Concerns
    - Surge inundation
    - Rainfall flooding
    - High winds
    - Tornadoes spawned by hurricanes
    - Hazardous materials
  - Phases
    - Hurricane watch
    - Hurricane warning
    - Hurricane
  - When hurricane is imminent
    - Stay tuned to local radio/T.V. for weather advisories & special instructions from local government
  - Upon issuance of a hurricane warning
    - Send students home according to district procedure
    - Close schools in threatened area
  - Prepare facilities for hurricane
  - If facility designated as shelter
    - Prepare the shelter

Hurricane (continued)

- Do not resume classes until facility is declared safe

- **Flood**
  - Determine elevation of building in relation to area:
    - Elevation in relation to streams, canals, or waterways
    - Know flood history in area
  - Evacuate areas that are subject to flooding
    - Stay out of dry creek beds
    - Avoid already flooded areas
  - Send students home or keep them at school until emergency subsides
  - Bus drivers
    - Train in flood avoidance
    - Know depth of dips before crossing
    - Watch for flooding at bridges & low areas
      - Road may not be intact under water
    - Plan alternate bus routes to avoid flood areas
  - Facilities should be constructed 1 foot above the flood plain level
  - If buildings become flooded have structure recertified by a structural engineer before occupying

- **Severe thunderstorm**
  - Defined as:
    - Storm with winds exceeding 58 MPH
    - Hail 3/4" or greater in diameter
    - Or tornado develops
  - Contains strong wind gust & down burst pf wind
  - Severe thunderstorm watch
    - Conditions indicate severe thunderstorm is possible
  - Severe thunderstorm warning
    - A severe thunderstorm has been spotted or indicated by radar
  - Take immediate shelter and remain indoors
    - Stay away from windows

- **Lightning**
  - Annual death toll higher than hurricanes or tornadoes
  - Train all school personnel in CPR
    - Lightning stroke victims can often be revived
  - Move students inside permanent structure when danger of lightning occurs
    - Cancel outside recess.
    - Conduct physical education classes indoors
  - Stay away from:
    - Open doors
    - Glassed in areas
    - Fireplaces
    - Radiators
    - Stoves

Lightning (continued)

- Metal pipes
- Sinks
- Plugged-in electrical appliances
- Electrically conductive elevated objects

- If in a vehicle, stay in vehicle
- If outdoors and no permanent structure:
  - Best protection cave or ditch
  - Avoid:
    - Highest object in area
    - Hill tops
    - Open spaces
    - Wire fences
    - Exposed sheds
    - Electrically conductive elevated objects
  - Keep twice as far away from isolated tree as the tree is tall
  - Get out of water
  - Get out of small boats
- Do not use telephones or electrical equipment during the lightening storm
- Develop policy for students that walk home or drive own vehicle
  - Keep at school under supervision until storm passes, walking is safe, or transportation is provided
  - Alternate:
    - Dismiss early before anticipated storm becomes severe
    - Provide emergency transportation
- Develop policy of school cancellation, delayed school opening, or late dismissal when
  - Road conditions are unsafe
  - Severe storms threaten
- Schools should be on a warning system with local emergency management agency and/or police department
- If electrical charge is felt
  - Hair stands on end
  - Skin tingles
  - Lightning may be about to strike you
  - Drop to ground immediately

- **Tornado**
  - Develop early warning system to alert all schools with local emergency management authorities
  - Hold pre-season drills at each facility
  - Equip each facility with a distinct tornado alarm
    - Should not be confused with fire alarm or any other type of alarm or evacuation signal
    - Have manually operated back-up system

Tornado (continued)

- Preparation
  - Instruct staff in specific procedures to take
  - Specific teachers assigned to round up students in playgrounds or other outdoor areas
- Determine best tornado shelter areas in each facility
  - Determine quickest way to get there
  - Use:
    - Lowest level / basements
    - Small interior rooms
    - Inner hallways
    - Bathrooms
    - Low interior spaces
  - Do not use:
    - Long-span rooms
    - Windowed areas
    - Corridors facing the wind, outer walls, or doorways
    - Relocatables or mobile structures
  - Shelter spaces
    - Determine space availability and number of persons which each area can house.
    - Post tornado shelter plan in each principal's office
    - Post in each room the location of the tornado shelter to be used by the occupants of the room and the quickest route to get to the shelter.
    - Provide copy of plan to the local emergency management office.
- Tornado watch
  - Conditions which may produce tornadoes are expected to develop.
  - Continue normal activities.
  - Send predesignated spotters to observation spots
    - Have clear view of south and west or of approaching severe weather
  - Move students from temporary structures
- Tornado warning
  - Tornado has been detected nearby.
  - Act quickly. Stay calm, quickly move to safe areas
  - Evacuate room quickly and orderly.
  - Once in shelter area
    - Assume protective squatting position with hands locked on back of neck
      - Remain in this position until instructed differently
  - If insufficient time to evacuate:
    - Go to inside wall away from windows

Tornado (continued)

- Squat on floor, face down
- Cover your head
- If in relocatables
  - If time permits, evacuate to interior corridors of permanent structures
  - Alternate: Seek shelter in a ditch or low spot on the ground away from relocatables
    - Assume fetal position and protect head
- If outdoors
  - If sufficient time go to a reinforced structure
  - Seek shelter in a ditch or low spot on ground
    - Assume fetal position and protect head
- If in motor vehicle
  - Stop and get out
  - Seek shelter away from vehicle
  - Do not use school buses during tornado warnings
- After storm passes
  - Check students for injuries
  - Report to principal in a predetermined manner
  - Check classroom for unsafe conditions
  - Close windows if weather warrants
- Shut off gas & power in actual emergency only
- Conduct drills frequently

- **Sink hole**
  - Evacuate the building
  - Do not re-enter building until the building is certified by a structural engineer and a soils engineer
- **Fire**
  - Post in each occupied space an evacuation route map
    - For new facilities the evacuation route should correspond to the life safety plan
  - Develop plan of where each class should assemble outside the building
  - Upon activation of the fire alarm:
    - Evacuate building(s)
      - See general evacuation procedures below with the following modifications
        - Immediately evacuate building to pre-arranged gathering places outside
        - Proceed to assigned spaces on grounds, away from the building(s).
  - Evacuation groups shall not stop in front of traffic entrances, drives, fire lanes, or other entrances that may be used by the fire department.
  - Groups shall not stop less than 60 feet from a building.

- **Gas leak**
  - Person identifying a gas leak shall notify the principal
  - If serious leak is found:
    - Evacuate the building, see general evacuation procedure below
    - Custodian shall shut off gas at meter
    - Notify maintenance department immediately
    - Notify the fire department
- **Toxic spill from truck or train**
  - If possible identify material
    - From considerable distance attempt to read hazard warning and numbers on diamond shaped placards placed outside of vehicle or tank
  - Call 911 or appropriate emergency number
    - Relay placard information
    - Indicate wind direction in case upwind evacuation is directed by emergency personnel
  - Gather students and staff from outside areas
    - Shelter in area not affected by spill or fumes
    - Close all doors and windows
    - Shut down air conditioning and ventilation systems until it is safe to turn back on
    - Alternate: Gather in an outside assembly area down wind and away from the spill.
  - Only trained rescue personnel should attempt to assist in clean up and rescue
    - Attempt to keep unauthorized persons away from scene
- **Earthquake**
  - Assume a low position as close to the center of the room as possible
  - Stay clear of book shelves, overhanging cabinets, hanging fixtures, etc
  - Take cover under closest desk, table, etc.
  - Keep students calm
    - Explain the phenomenon of a earthquake. Knowledge helps to ease the fear and lessens panic.
  - If the shock is severe enough to cause structural damage, evacuate the building after shock waves have sub-sided.
  - Principal shall do a preliminary inspection and notify the superintendent of the results
  - The threat of earthquakes in Florida appear to be minimal
- **Nuclear**
  - Nuclear plant accident
    - Evacuation zone is within a 10 mile radius.
    - Warning of emergency by sirens, emergency broadcast system NOAA weather radio, door to door notification, Channel 16 VHF
    - Instructions will be to stay indoors or evacuate.
    - Arrangements will be made for persons with special needs

Nuclear (continued)

- Schools will follow their own evacuation procedures

- **Epidemic**
  - Consult with HRS
- **Criminal**
  - Bomb threats
    - Treat all bomb threats seriously
    - Person receiving bomb threat shall:
      - Attempt having the caller indicate where bomb is located and when it will go off.
      - Keep caller talking as long as possible and try to identify callers:
        - Age
        - Gender
        - Type of voice and/or accent
        - Background noises
        - Other information that may be used to identify the caller
      - Immediately notify the principal/dean
    - Principal/dean shall Notify superintendent/president & determine next course of action to be taken
    - Evacuate the building, see general evacuation procedures below
      - If students are to be relocated to another facility:
        - Notify transportation department of immediate need to relocate staff & students.
        - Notify parents of relocation of their children
    - Secure building as best possible
      - All windows closed, all doors locked
    - If police or fire department is called:
      - Provide them with all necessary information
      - Provide with F.I.S.H. plan and keys for facility for a bomb search
      - Bomb squad will remove bomb
      - Investigation by appropriate authorities
- **Explosions**
  - Evacuate from danger area
  - Result of:
    - Arson
    - Vandalism
    - Terrorism
- **General evacuation procedure**
  - Students should stop work immediately
  - Teachers in technical vocation, home economics, etc. shall verify that motors, torches, gas & water outlets, appliances, etc. are turned off.

General evacuation procedure (continued)

- Have assigned students assist the physically disabled
- Immediately evacuate to pre-arranged shelter/gathering places
  - Do not pick up papers, textbooks, etc.
  - Do not close windows, or do anything that will delay the evacuation
- Speed is subordinate to control and order. No talking, running, or skipping steps on stairs.
- Last person (adult) to leave room should check to be sure that everyone is out and than shut the door.
- First staff member to reach a door shall open it and shall keep it opened until everyone is out or is relieved by another staff member.
- Staff should check adjoining toilet rooms
- Proceed to assigned shelter/gathering places.
- Pupils in lavatories or out of their room shall join the nearest line in making exit and proceed to a staging location.
  - With permission of those in charge the student shall join their own class, report to the teacher, and take their place in line.
- Staff shall evacuate as soon as their assigned duties are completed.
- Check roll and keep students quiet and calm
  - Report missing students to principal or asst. principal

- **Develop a plan for disasters**
  - Establish authority under which plan is developed
  - Determine:
    - What to do prior to the event
    - What to do during the event
    - What to do after the event
  - Identify:
    - Critical functions
    - Resources required to support function
    - Time table to implement function
  - Address
    - Coordination
    - Communications
    - Logistics
    - Who is to perform each task
    - Who is to report & when
    - Where task will be done
    - How task will be done
  - Organize a school based disaster committee
  - Continuation of normal business with reduced staff
- **Analyze facilities vulnerability to disasters**
  - Assign risk probability to each type of disaster
  - Assign resources accordingly
- **Set up a chain of command**
  - Chain of command
    - Define specific roles and responsibilities
  - Assign alternates
  - Identify person & alternates who are authorized to activate the emergency plan
  - Determine policy of when & how chain of command will be activated
- **Director/administrator**
  - Implements plan
  - Properly skilled
  - Make quick decisions related to construction, building materials, and safety
- **Assign personnel to disaster and recovery teams**
  - Assign duties to team members
    - Consider:
      - Residence in evacuation zone
      - Single parent families
      - Sick
      - Elderly parents
  - Train personnel in their expected duties
    - Train for specific responsibilities in order to ensure that they can be implemented.

Assign personnel to disaster and recovery teams (continued)

- General orientation of staff to advise them that there is a procedure
  - Explain how procedure will work
  - Disseminate personal disaster preparedness information for employees.
- Prepare emergency contact list. Include:
  - Name
  - Title
  - 24 hour telephone number / cellular number
  - Disaster assignment
- Staffing should be consistent with union contracts & district policies
- Identify essential & non-essential employees for each phase of disaster operation.
- After event staff will work full time assessing and overseeing repairs
- Will not have time to handle their normal duties

• **Arrange contracts for**:

- Insurance negotiator
- Air service for aerial survey
  - Have someone available that has knowledge of reconnaissance flights
- Security services
  - Security services at school shelters for times police force is not present
- Portable toilets
- Generators
- Red cross for use of educational facilities as shelters
- Equipment for cleanup
- Building materials for post disaster use
- Contingency agreements with contractors
  - Roofing
  - Electrical
  - Mechanical
  - Glazing
  - Water clean up
  - Portable classrooms
  - Tree removal
  - Fencing
  - Security
  - Bus service
- Professional photographic services
  - Photograph all damages at all facilities
- Emergency transportation

• **Develop alternate means of procuring goods and services**

- Computer may be down for many days.

- **Develop plan to pay**
  - Employees when the system shuts down
  - Vendors when the system shuts down
  - Vendors for recovery supplies
  - Compensation for employees performing extra duties performed during disaster
    - Reimbursement for out of pocket supplies prior to or right after the event
  - Consider giving each school a check for using local resources to open schools
- **State and federal assistance**
  - Develop assistance procedures
  - Determine coordinator for all matters pertaining to federal public assistance
- **Establish records recovery team and procedures to deal with damaged records**
- **Facilities (General)**
  - Have all roofs repaired as required
  - All windows caulked
  - Identify which facilities are to be used as shelters
  - Provide facilities with:
    - Battery operated radio or T.V.
    - One flashlight for each person that is assigned to the facility during the event
    - Fire extinguishers with current inspection & servicing
    - First aid kit
    - Emergency tool kit
    - Extra battery packs
    - Food and water for staff assigned to facility during the event
    - Utensils for preparing food
    - Signage
      - "EMERGENCY SHELTER"
      - "NOT A SHELTER AREA. AUTHORIZED PERSONNEL ONLY"
  - Provide coupling for external large capacity generator
    - Identify loads that are to be supplied by portable generator
    - Design and install required electrical modifications
  - Install emergency generator at:
    - Central administration
    - Central computer system(s)
    - Command center(s)
    - Install large fuel tanks
      - Particularly where shelter operations or necessary facility operations may endure for extended periods of time
    - Be totally self contained
    - Provide protected walkway from main building to generator

Facilities (General) (continued)

- Permit maintenance and monitoring in time of need
- Determine where relocatables can be obtained for emergency use
- Provide wet/dry vacuum cleaner at each facility

- **Provide additional warehouse space for disaster & recovery supplies**
- **Identify agencies that may provide manpower & supplies after the event**
  - DOE-Educational Facilities
  - Other school boards/community colleges
    - Mutual aide agreements
  - Colleges
  - Volunteers
  - Military
  - Plan for teams outside the area to move quickly into impacted areas
  - Agencies outside of the district that may be used to get information to & for volunteers
    - DOE-Educational Facilities
    - Establish a single point of contact for volunteer coordination
    - Establish volunteer hot line
- **Identify alternate facilities and plans to those that may be damaged or destroyed.**
- **Identify distribution centers where emergency supplies & information can be first available**
- **Set up policy for paying recruited volunteers for damage assessment teams.**
  - Pay for
    - Mileage
    - Air fares
    - Lodging
    - Meals
  - Develop forms & procedure for payment
- **Storage of schematic FISH plans**
  - Command center(s)
  - DOE-Educational Facilities
  - Each facility
  - Police department
  - Fire department
- **Update construction unit cost estimates yearly including**
  - Tree trimming & removal
  - Roofing
  - Windows, & glazing
  - Doors
  - Ceiling systems
  - Carpet
    - New
    - Cleaning

Update construction unit cost estimates yearly including (continued)
- Clean-up & debris removal
- Fencing

- **Review a disaster preparedness plan and update annually**
- **Test plan periodically**
- **Document condition of facilities and equipment periodically**
  - Do aerial photographs to establish facilities condition
  - Do aerial photographs after major construction projects are completed
- **Transportation**
  - Obtain list of all bus drivers and alternates with after hours contact phone numbers
  - Determine times to complete transportation operations under normal and emergency conditions
- **Organization of federal, state, and local post disaster and recovery teams should be aligned and parallel**
- **School district person should be present at county/city emergency command center**
  - Functions as liaison between school board and emergency management
  - Coordinates special request
  - Provides first hand factual information communication
  - Should be someone that knows the organization of the district, and who to contact to get things done
  - Have inventory of all school board owned property including vacant land
    - Summary of property size and facilities
    - Aerial photographs
- **Vo-tech centers can be used to train trades people to help in the reconstruction of the community**
- **Provide employees with personal disaster preparedness information.**
- **Education of students**
  - Provides:
    - Student awareness of rationale
    - Translation of survival skills
      - Particularly when they become adults
    - Prepare for future risk in making future decisions on construction & location of their own homes
  - Primary school students
    - Made aware of natural phenomena and man-made hazards that cause disasters
    - Trained in safety and survival procedures
    - Acquainted with people & agencies that provide emergency services
    - Develop self confidence in problem solving & decision making
  - Intermediate & secondary level
    - Scientific and technical information about hazards

- **Review all insurance to determine limits of liability**
  - What is covered.
  - What is not covered.
  - Replacement cost, who pays for?
  - Is wind/storm coverage included?
  - Is contents insurance included?
    - Vital records
    - Furniture, fixtures & equipment
  - Flood insurance
    - In what FEMA Flood Zone is facility located
    - Is facility in high hazard evacuation zone?
  - Determine who pays for required upgrading of construction to meet:
    - Current building codes
    - FEMA for flood plain floor elevation
  - Understand the differences between
    - Wind coverages
    - Flood coverages
    - Coverages for other damages
- **Update insurance coverages if needed.**
  - Insurance markets close once an imminent danger exist
  - Consider the use of multiple carriers
- **Investigate insurance carriers**
  - How well they work with you
  - How well they work with other districts
  - How well they performed in other disasters
- **FEMA (Federal Emergency Management Administration)**
  - Secondary insurance for when primary coverage is exhausted
  - Document everything
  - Requires roofs to be dried in
    - Even for demolished structures
- **Property coverages - consider**
  - Carrier physical stability
    - Determined by reputable rating organization
    - Geographical distribution of policy holders
    - Reinsurance specifications
    - Major disasters speed the demise of small, geographically restricted companies
  - Amounts of coverage
    - Insurance recovery in event of disaster affected by:
      - Total amount of insurance available in event of disaster
      - How coverage is applied
        - Per site

Property coverages - consider (continued)

- Per occurrence
- Combination

- Broadest coverage for lowest cost
  - Single per occurrence limit applied on a blanket basis
  - Risk manager determines maximum amount of property damage that may occur if major disaster strikes.
- Caps (limitations) on certain types of losses
- Deductibles
- Replacement vs depreciated values

- **Loss of income coverages**
  - Loss of tuition beyond expected
  - Loss revenue at
    - Bookstores
    - Restaurants/snack bars
    - Sports arenas
    - Auditoriums
    - Leased property
- **Extra expense coverages**
  - Defrayal of cost of continuing institution's operation after loss from a covered event
  - Covers a loss that has evolved over a period of time
- **Contract with an insurance negotiator**
  - To provided services for negotiations with the insurance companies over damages sustained.
- **Contract with a professional cost estimator to determine cost of repairs & replacements**.
- **Facilities used as shelters**
  - Develop agreement with Red Cross to limit liability
- **Future litigation. Those that may be held responsible may include**
  - Government officials
    - Promote & permit development of hazardous sites
  - Land owners, developers, & lenders
    - Build on unsafe locations
  - Architects and engineers
    - Design structures that will not resist hurricane forces
  - Builders, contractors and workers
    - Work is structurally unsound
  - Real estate brokers and sellers
    - Promote unsafe structures
    - Overlook mentioning potential hazards
  - Consumers
    - Invest savings into changing environmental situations
  - Plaintiff must establish

Future litigation. (continued)

- Defendant owed a duty of care to plaintiff
- Defendant breached the duty
- Plaintiff suffered damages
- Defendant's breech of duty was the proximate cause of all damages

- Violation of a building code requirement is evidence of negligence
- Individuals who are injured as a result of a storm may seek compensation from the owner or occupier of the building where the injury occurred
- Victims of a hurricane may find relief for inadequate performance of a contract

- **School facilities have and will continue to serve as the principal source of public shelter**
- **Shelters in other districts far from the disaster area may be used to house those that evacuate the disaster area**
  - Shelter people caught in evacuation routes
- **Core facility areas in all new educational facilities will be shelters**
  - Exception: Facilities or part of is exempt due to its:
    - Location
    - Size
    - Other characteristic making it not acceptable by the local emergency management agency or the Department of Community Affairs.
- **Identify and provide:**
  - Funding to provide additional cost for construction of emergency shelters
  - Classification
    - Storm shelter - facility used to shelter evacuees in the path or at direct risk of a storm impact
      - Should not impact school sessions
    - Host shelter - facility that is not in the path of the storm
      - Will impact school sessions

    Both types may be used for:
      - Short term disaster
      - Long term disaster
  - Location
    - Locate outside category 4 storm surge inundation zones is preferred
      - Areas with severe shortage of shelter space consideration can be given to facilities in category 4 storm surge with a maximum expected height surge in the building of one to two feet.
    - Avoid buildings subject to isolation created by:
      - Storm surge inundation zones
      - Riverine inundation of roadways
    - Do not locate on barrier islands
    - Locate outside 100 year floodplain
    - Avoid shelters in the 500 year flood plain where possible
    - First floor elevation should be equal to or higher than FEMA base flood elevation level
    - Consider proximity of dams or reservoirs
    - Avoid locations within 10 miles of a nuclear power plant
    - Facilities that store certain types or amounts of hazardous materials may be inappropriate as a shelter
    - Consider evacuation & evacuation route models
    - Access routes should not be tree lined

Identify and provide: (continued)

- Shelter needs during an event and after an event are different
  - During: Use protected areas
  - After: May use large areas for housing/sleeping
- Structural considerations
  - In compliance with building & fire codes
  - Withstand wind loads in accordance with ASCE 7-88, and ANSI A58, 1982
    - Alternate: Have structural engineer rank building in accordance with the above criteria
  - All buildings structurally sound
    - Concrete & masonry construction recommended
  - Avoid
    - Buildings with long or open roof spans
    - Un-reinforced masonry buildings
    - Pre-fabricated steel buildings constructed before the mid-1980s
    - Buildings exposed to the full force of hurricane winds
    - Buildings with flat or lightweight roofs
    - Buildings that are under construction
  - Consider building in it's entirety. One weak link may jeopardize the whole structural integrity of the building
  - Pod plans objectionable because of control and communications
  - Consider location of other buildings in relation to shelter
    - Location of relocatables
- Interior considerations
  - Use
    - Interior corridors
    - Use 3/4 area for calculating usable area
      - Remainder devoted to circulation
    - In multi-story structures, use lower floors, avoid corner rooms
    - Interior rooms
  - Avoid
    - Rooms attached to or adjacent to un-reinforce masonry walls
    - Spaces with large roof spans such as:
      - Gymnasiums
      - Auditoriums
      - Cafetoriums
    - Areas near glass unless protected by storm shutters
      - Storm shutters should meet the wind loads and impact resistance standards of SBCCI Standard SSTD 12-94
        - Alternate: Meet Dade County South Florida

Identify and provide: (continued)

Building Code Sections 2314.1 & 5, and 2315.1 through 2315.5

- Basements for hurricane and floods
- Wall section adjacent to portable or modular classrooms

- Do not use
  - Perimeter classrooms with non-shuttered glazing
  - Administrative offices
  - Custodial rooms
  - Labs
  - Sewing or home economics
  - Rooms with specialized equipment
  - Areas with expensive equipment
  - Rooms less than 250 sq.ft. in area
  - Stairways
  - Hallways immediately surrounding stairways
  - Hallways immediately adjacent to registration area
  - Portable buildings
  - Areas with suspension roofs
  - Fixed seating areas
  - Stage areas unless free of safety problems
- Physical characteristics required at an emergency shelter
  - Preferred minimum desirable usable area 10,000 sq.ft.
    - Facilities with smaller useable areas may be used
  - 40 sq.ft. per shelter resident
  - Storage required beyond normal school functions.
    - Food
    - Medication
    - Office supplies
    - Batteries
    - Supplies for emergency repairs
  - Sanitation.
    - Extra supply of disinfectants
    - Supply of antiseptic for cleaning hands at toilet
    - Extra supply of toilet paper & towels
    - Means of disposing of human waste
      - Toilet facilities may not function
        - No water pressure to flush toilets
        - Lift stations with no power
    - Garbage storage
  - Emergency power.
    - Life/safety items
    - Outlets for shelterees requiring special medical equipment

Identify and provide: (continued)

- Lights at
  - Halls
  - Places shelterees housed
  - Toilets
  - Kitchen
  - Administration
  - Clinic
- Ventilation
- Kitchen
  - Refrigeration/freezers
  - Nominal kitchen equipment
- Generator propane tanks stored in safe area
- Communications
  - Primary: Land based telephone
    - Direct lines to command center
    - Independent of computerized phone systems
    - Accessible to Red Cross shelter manager
  - Back-up: Ham radio
    - Locate in secure office area
    - Connect to Emergency Management antenna system at each shelter
    - Ham-radio communications between Superintendent and schools designated as shelters
    - Antenna and emergency powered outlet for ham operator
  - Weather alert radios
  - Public address system
  - Radio and/or TVS can provide emergency broadcast from local stations
  - Police & paramedics have own communication systems
  - Way for shelterees to communicate with family outside the area after the event
- Emergency food preparation area
- First aide facility.
- Address individuals with special needs
- Parking for large number of cars
  - Do not park adjacent to buildings
- Emergency vehicle access to shelter
- Plan for reduction in district wide/community college shelter capacity due to construction.

- **Red Cross with the school districts/community colleges determine which facilities are to be used as shelters.**
  - Initiate a written agreement between the School Board/Community College and the Red Cross regarding the use of school facilities as shelters. Include clauses regarding responsibilities, reimbursements, chain of command, duties, authority, which facilities used, employment, food service, etc.
  - Red Cross inspects shelters yearly
  - Opening of shelters is determined by emergency management
    - Opening of shelter directed to principal/dean through the superintendent/president
    - Principals/deans responsible to open shelter at the designated time
    - Once shelter is opened, control passes to the Red Cross
- **Historically, Red Cross contracts with school board/community college for the following:**
  - Reimbursement
    - School board reimbursed for:
      - Foodstuff & supplies
      - Damage to property
      - Wages incurred
      - Utilities
      - Clean up
  - Determine liability issues
    - Hold harmless & indemnify agreement
    - Legal liability and cost incurred in respect to
      - Bodily injury
      - Death
      - Property damage
      - Theft of school board property
    - Red Cross tries to get injured person's insurance to kick in first
  - Personnel to help run shelter
    - Principal/dean = Facilities Manager
      - In charge of discipline
      - Operate shelter in safe, efficient manor
      - Other duties requested by Red Cross shelter manager
      - Oversee protection of school board property
      - Fill out request for placement of personnel on the overtime payroll
        - Payment made through school board
        - School board submits to Red cross for reimbursement to school board
      - Consider some type of compensation for principal or asst. principal used by the Red Cross as Facility Manager

Red Cross contracts with school board/community college for (continued)

- Head custodian
  - One to two workers per 500 victims
- Food service manager
  - Organize food service
  - Serve snack type food
  - May employ additional personnel
    - Two to four workers per 500 victims
  - Request volunteers from shelterees
  - Fill out all reports required for:
    - Use & reimbursement of food & supplies used
    - Salary payment for food service personnel
- Volunteers
  - Assistant principal
  - Teachers
- Arrange for relief of personnel if shelter is to be used for extended periods of time
- Required custodial and food service personnel are compensated in conformance with their contract by the Red Cross
- Red Cross compensates school board for hourly staff used after first 24 hour period of shelter use

- **Other personnel at shelter**
  - School secretary
    - Office management
  - Red Cross shelter manager
    - Registers all shelterees
  - Police officer
    - Enforce discipline
    - Maintain peace
    - Assist in protection of school board property
    - May be at shelter only when they cannot be on the road
  - Communicators
  - Ham radio operator
  - Red Cross volunteers
  - Paramedics
  - Nurses
  - Around the clock personnel required to handle emergencies
- **Operations**
  - Food service
    - School food service program will provide emergency meals at the shelter
      - Snack type meals
    - Prepare menus for meals during event
      - Maximum of three meals

Operations (continued)

- Order food for Emergency Inventory
  - Use as regular inventory
    - At predesignated intervals
    - In order to have a continuous fresh supply
  - Re-order food at set intervals
- Commodity foods used at extent permitted between USDA and Red Cross
- Extended use of shelter:
  - Use food and non-food supplies through regular inventory
  - Red Cross to deliver food & non-food supplies
- Shelterees should:
  - Eat a meal prior to coming to the shelter.
  - Pack
    - Two weeks supply of medication
      - Shelterees will not bring required medication
    - Personal hygiene items
    - Several changes of clothing
    - Special necessary foods
    - Identification and valuable papers
    - Battery operated radio
    - Flashlight
    - Extra batteries
    - Collapsible lawn chair
    - Blanket & pillow or sleeping bag
    - Money
  - Pets are not permitted in shelters
  - Substance abuse not permitted at shelters
  - Remain in shelter until informed by those in charge that it is safe to leave.

- **Special needs people will be dumped at the shelter**
  - Should be registered with Emergency Management Office prior to hurricane season
- **After the event and with superintendent's/president's approval, shelters may be used for:**
  - Shelter
  - Food kitchens
  - Hospital
  - Tent city
  - Distribution centers
    - Food
    - Water
    - Clothing
    - Building materials
  - Recovery center

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After the event shelters may be used for (continued)

- Service centers
  - Red Cross provides 23 disaster relief functions
  - FEMA
  - Salvation army
  - Veterans Administration
  - Medical
    - MASH Units
    - Clinics
    - Dental
    - Prescriptions
- Communications facility
  - Telephone companies's telephone banks
- Transportation centers
  - Bus transportation distribution
- Community center
  - Meeting rooms
  - Commercial services
    - Barber
- If military is activated for the emergency schools may be used for
  - Housing
  - Feeding
  - Distribution

- **Surviving schools not designated as shelters may become shelters**
- **Red Cross tries to close shelter as soon as possible**
  - Consolidate shelters
  - Move shelterees to better location
  - Solve shelterees problems and vacate shelter

- **Command center**
  - Establish location of command center
    - Alternate: Mobile center with portable generator
  - Select an alternate location(s) for command center
    - Consider one location outside district boundaries
  - Equipment
    - Emergency power
    - Communication equipment
      - Communication tie in with operation center
      - Direct line telephone(s)
        - Computer telephone systems may be down when power is out
        - Cellular phones
      - Public address system
    - Office/clerical space for small core of personnel
    - Large meeting room(s)
    - Adequate parking
      - For staff and volunteers
    - Furniture & equipment
      - Tables
      - Chairs (comfortable)
      - Copier
      - Computer/printer
      - FAX
      - Easel
      - Paper & office supplies
        - Large pads of paper (24 x 36)
      - A/V equipment
      - Refrigerator
    - FISH inventory, plans, and photos
    - Food and drink
    - Toilet facilities
  - Prior to the event: Implement plans
  - During the event: Skeleton crew
  - After the initial event: Gathering, assimilation of information, and directives
- **Disaster team organization**
  - Develop disaster organization chart
  - Appoint chair person
  - Determine personnel and alternates to fill organization chart.

EMERGENCY COMMUNICATIONS

- **Communication is the most critical resource in emergencies**
- **Appoint one person as communication coordinator**
  - Assign back-up person(s)
- **Determine type of emergency communication equipment to be used:**
  - Portable phones
  - Cellular phones
    - Towers may be destroyed for weeks
  - CB's
  - VHF
  - Walkie-talkies
  - Ham radio
  - Land based communication lines
- **Supply key personnel with portable communication equipment**
- **800 MHZ radio communications system should be expanded to include channels for emergency management**
- **Prepare for normal communications outage**
- **Determine emergency warning policy**
  - Provide alternate communications system
- **Develop a means of releasing coordinated information to the media and public**
  - Releases should be coordinated with other governmental agencies
- **Emergency phone bank (hot line)**
  - Establish to provide information during and after an event
    - Provide school related information to:
      - Students
      - Parents
      - School employees
    - Rumor control
    - Calls from volunteers offering help
  - Activate as soon as possible
  - Identify phone bank personnel
    - Utilize PTA and PTSA
    - Develop schedule of operators for each day
  - Develop notebook for each operator. Include:
    - Pertinent information & updates
    - Rumor control phone number
    - Vital Public Service directory information
    - Bulletins from emergency operation center
    - Directives from superintendent
    - Updates from school operations and other authorized sources concerning school closing
    - Changes in school operation hours
    - Changes in transportation schedules
    - Other relevant & appropriate information
  - Attend to all technical details regarding phone bank information line.

Emergency phone bank

Equipment required:

- Phone lines & terminals
- FAX machine
- Network printer
- Television/radio
- Copier
- Answering machine

- Pre-record message so it will be ready for immediate use when activated

Include:

- Hours of operation (8 AM to 6 PM)
- Prepared and authorized bulletins

- Use public TV and radio to get message out
  - Schedule same time each day
  - Summary of days decisions
- Use PTA and PTSA to disseminate information to communities

- **Remove sensitive equipment from shelter areas**
- **Security between shelter and rest of facility**
- **Security after the event from looting and break-ins**
  - Lot of content loss immediately after the event if security is not provided.
- **Identification cards**
  - School personnel with picture
  - Outsiders with picture
- **Arrange for passage through security areas**
- **Determine responsibility of school district police.**

- **Relocate important documents to a safe storage area.**
  - Schematic FISH plans
    - Alternate: Send a copy to DOE-Educational Facilities
  - Construction contract documents
  - Insurance papers
  - Payroll files
  - Computer backup & programs
  - Place important documents in sealed plastic bags
- **Make copies of**:
  - All vital records
  - Contracts
  - Insurance papers
  - All forms and documents required for assessment teams and store in a safe area.
  - Copy machines may not be available after the event
- **Have a hard copy list of all personnel to contact with phone numbers and addresses**
- **Review disaster plan of action**
- **Finalize shift configurations**
  - Remind personnel of expected duties and policies regarding a disaster.
- **Have skeleton crews report to their prescribed facility**
  - May want to let skeleton crews bring their families with them
  - Develop policy when these crews can have time to prepare their personal property.
- **Check all equipment and communication systems**
  - Verify that command center(s) is operational
  - Verify that equipment at schools are operational
- **Facilities**
  - Remove all loose material/equipment on the exterior.
  - Check roof & roof drains
  - Check security & flood lights
  - Board up doors & windows
  - Secure facility
    - Lock all doors, windows, other openings
  - Remove sensitive equipment from shelter areas
  - Move desk, files, furniture, and equipment away from unprotected openings.
  - Wrap electrical equipment in plastic garbage bags.
  - Place equipment as high as possible in case of flooding.
  - Papers, drawings, etc. should be placed inside drawers or files
  - Check generator
  - Check fire extinguishers
  - Turn off air conditioners, disconnect electrical equipment, turn off lights prior to a hurricane.

- **Obtain extra materials for securing the facility after the event:**
  - Plywood
  - Sheet plastic
  - Fasteners
- **Obtain additional supplies as required**
  - Food
  - Water & drinks
  - Batteries for radio, hand-held radios, T.V., and flashlights
  - Film
- **Top-off fuel tanks**
  - Emergency generators
    - Oil for generators
      - They will run 24 hrs/day for several days and burn more oil than usual.
  - Vehicles
- **Arrange vehicles in an area and configuration that will provided the greatest safety.**
  - Do not park vehicles near a building with a built-up gravel roof
    - Loose stones will damage finishes
- **Arrange for portable potties in the event of power failure**
- **Shelters**
  - When shelter is designated to be opened notify principal
- **Public transportation may not be adequate to transport all required evacuees.**
  - School busses may be used to help evacuation of citizens.
  - Coordination with Red Cross
  - Bus communication with Red Cross to determine where evacuees are to be taken.
  - Alternate: Radio equipped staff car

DURING THE EVENT

- **Coordination with Red Cross**
- **Command center manned**
- **Skeleton crew at facilities for emergency repairs and security**
- **Do not leave facility before all clear**
- **Shelter may become destroyed and shelterees may have to be relocated**
- **Support personnel, police, fire, paramedics, will hunker down after the wind reaches a predetermined speed**

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- **Immediate response required to protect facility from further damage and vandalism**
  - After Hurricane Andrew, Dade County Public School facilities suffered damage from vandalism and from rain storms that came after.
  - Interior spaces, equipment, furniture could have been preserved if facility was dried in immediately after the event
- **District disaster team assembles and starts work**
  - Assembles at direction of Superintendent/President
  - Employees to report as determined by Superintendent/President and disaster plan procedures
- **Contact DOE-Educational Facilities**
  - Can contact other school districts and colleges for services
  - Provide coordination with other agencies for emergency services
  - Respond to board initiatives for emergency provisions for repairs
  - Assist in evaluation of facilities
    - Contact other districts and professional societies for help
- **District personnel**
  - Contact all personnel
    - Determine their status
    - Extent of their damage
    - Their concerns
    - Can they assist/work
    - Help them get back to work
    - Give them time to get their lives back together
    - Do not count on the ones in devastated areas
  - Arrange for temporary housing
  - Arrange for temporary loans
    - Employment verification for loans
  - Arrange counseling
  - Arrange for day care for workers children
  - Arrange to relieve those that served as skeleton crews, and at shelters so they may check on their family & homes
  - Arrange for outside agencies that supply services to meet with employees
    - FEMA
    - Red Cross
    - Insurance carriers
    - Relief supplies
- **Maintain contact with County Emergency Operation Center**
- **Contact other groups that may be available for help:**
  - Other school districts
  - FEMA (Federal Emergency Management Administration)
    - Work out procedures
    - Become familiar with their rules and procedures

Contact other groups that may be available for help: (continued)

- National guard
  - If activated
- Military
  - If activated
  - Very instrumental in helping get facilities back after Hurricane Andrew
- US Forestry Service
- Volunteers
  - Expect a great number of them
  - Victim volunteers
    - Do not ignore them - utilize them
      - Will not get them back when they are needed
      - Reduces ability of "official" relief workers to function well in community in the later stages of the relief effort

- **Contact suppliers for necessary materials**
- **Develop accessible staging areas outside damage zone**
- **Do aerial survey to determine extent of damage**
- **Outside work forces**
  - Volunteers should supply their own
    - Food
    - Water
    - Lodging
    - Gear
    - For as long as they stay, minimum 1 week
  - Volunteers may not bring their own, will need to provide
    - Shelter
      - Bed
      - Personal storage
      - Toilet/shower facilities
    - Drinking water
    - Food
  - Issues
    - Turnover
    - Attrition
    - May want to take over
- **Transportation**
  - Slow traffic flow
    - Blocked roads
      - Fallen trees
      - Power lines & poles
      - Billboards
    - Debris on roads

Transportation (continued)

- No signs or landmarks to tell where you are
- No traffic control
- Increase in accidents after event
- Magnitude of traffic
  - Looters
  - Tourist
  - Fewer usable roads
  - Recovery crews
- Impacts
  - Work force transportation
  - Debris removal
  - Getting materials to the site
- Short term vehicular operating cost climbs 35% due to delays in traffic

- **Disruption of**
  - Power
  - Communications
  - Water/sewer
  - Local commerce
  - Order
  - Impacts
    - Emergency power
    - Two-way communications
    - Portable toilets
    - Local availability of:
      - Supplies
      - Materials
    - Non-electric powered or hand tools may be required
- **Local authorities check schools for victims**
- **Implement contingency agreements with contractors**
  - Roofing
  - Electrical
  - Mechanical
  - Glazing
  - Water clean up
  - Portable classrooms
  - Tree removal
  - Fencing
  - Security
  - Bus service
- **Correct dangerous conditions**
  - Live power lines
  - Broken or leaking gas lines
  - Broken fuel lines, storage facilities

Correct dangerous conditions (continued)

- Broken water lines
- Sewage overflow

- **Secure facilities - board up**
  - Broken windows
  - Doors
  - Openings in walls
- **Vital records**
  - If damaged by water do not touch
  - Contact records recovery team for advice and assistance
- **Computers - do not turn on if:**
  - Low voltage/power fluctuation
  - Low air conditioning output
  - Broken windows
  - Damaged windows
  - Evidence of water infiltration
- **Address morale issues**
- **Buildings will continue to deteriorate**
  - Water damage
  - Mold & mildew will develop
  - Vandalism
  - Roof collapse from standing water on roofs
- **Most injuries and deaths occur right after the event**
- **Prepare for an avalanche of donated supplies**
  - Pre-arrange storage and distribution place(s)
  - Assign personnel to help unload & to distribute supplies as needed
  - Coordinate donation distribution with other county, city, governmental, and/or private agencies
- **On going capital improvement projects will come to a halt.**

- **Command center**
  - Locate damage assessment command center:
    - Near transportation corridors
    - Outside of heavily damaged area
    - Outside curfew zone
  - Central clearing house for information
  - Master list of teams and assignments
  - Master list of facilities
  - Graphic Information System coordination if available
  - Wall map with facilities location identified
  - Means to manage messages
    - Bulletin board
    - Beepers
  - Required staff
    - District person that can call area superintendent or principals and get things done.
    - District person that can get things fixed through maintenance
    - Someone to manipulate paper work, get teams organized.
    - Trainer for assessment teams
    - Data entry coordinator
      - Will not be needed until teams return from first day of damage assessment
- **Value of outside assessment teams**
  - Objective assessment
  - Professional judgement
- **Solicit volunteers for assessment teams.**
  - Solicit from:
    - DOE-Educational Facilities
    - Other school districts/community colleges
      - DOE-Educational Facilities can help do this for you
    - American Institute of Architects
    - Professional Engineers Society
  - Use public services messages
    - Tell what is needed
    - Tell volunteers what to bring
  - Do not depend on own personnel to come in
  - Tell team members:
    - What work consist of
    - Availability and where to obtain or provide own:
      - Shelter
      - Food & water
      - Fuel
      - What to bring

- **Organize participants into teams**
  - Have volunteers sign in each day
    - Name
    - Field of expertise
    - Organization
  - Will not know expertise and experience of each team member until they sign in each day
  - Team members will come in groups and want to stay together
    - Will not always be possible
  - Team members may have own agenda which may conflict with the assessment purpose and organization.
  - Takes about 1 ½ to 2 hours at beginning of each day to organize teams
  - Teams will be reconfigured daily
    - Members not returning
    - New members arriving
  - Hand out expense form to each volunteer each day
    - Collect at end of each day
  - Teams to consist of a minimum of one of each (desirable)
    - District personnel that knows the area.
    - Architect
    - Structural engineer
    - Mechanical engineer
    - Electrical engineer
    - If all member types are not available have at least one architect/structural engineer and one systems engineer on each team.
  - Consider computer program to organize teams
  - Team leader to obtain from each team members:
    - Name
    - Organization
    - Field of expertise
    - Home phone number
    - Home address
- **Assign facilities to each team**
  - Assigned facilities should be in the same general area.
  - Maximum of three facilities per team per day.
  - Consider travel restraints when assigning facilities.
  - Order of investigation:
    - Least damaged
    - Most damaged
    - For morale purposes - investigate damaged schools no later than second day
    - District may not have access to severely damaged school(s) the first day(s)

- **Team leader**
  - Must know the area
  - Have keys to facilities
    - Alternate: Meet someone with keys at each facility
- **Reports**
  - Initial post crisis report
    - If possible, can be done by principal, custodian, zone mechanic, or maintenance personnel with a phone call.'
  - General assessment report
    - By assessment teams
  - Specific repair report
    - By district personnel or consultants
    - Fill out FEMA forms
  - Cost & time for temporary repairs
  - Cost & time for permanent repairs
  - Consultants studies
- **Equipment required for assessment teams**
  - Equipment supplied by district
    - Temporary I.D. for secured areas
    - Keys to access all facilities
    - FISH schematic plans
    - Map with facilities location
    - Instamatic type camera (Polaroid)
      - Do not use cameras that require the processing of film.
      - Do not use 35mm type cameras
        - Will not be able to I.D. photos after they are developed
    - Video camera when possible
      - Battery packs. There may not be a way to recharge batteries.
    - Film for cameras
    - Report forms with examples
      - In data base format
    - Communications system
  - Equipment supplied by team members
    - Flash lights & batteries
    - Pencil
    - Clipboard
    - Pads
    - Tape measure
    - Appropriate clothing for region and season
  - Equipment supplied by either
    - Transportation
    - Fuel for transportation
      - Obtain beforehand

Equipment required for assessment teams (continued)

- Designate where fuel can be obtained
- Food & liquids
- Small tools to gain access:
  - Crowbar
  - Hammer
  - Screw driver
- Small first aide kit

- **Personnel familiar with the facility to meet assessment teams at each facility.**
  - Principal
  - Custodian
  - Others with master keys
- **Identify:**
  - Imminent dangers first
  - Safety/health hazards second
    - Test life-safety systems
  - Facility damage
    - Assess what can be:
      - opened
      - Not opened
      - Partially opened
      - Repaired
      - Saved
  - At end of each day
    - Complete and turn in paper work before leaving
  - Turn in all photographs with proper labeling
    - Label back of photographs
  - Turn in travel expense sheets
    - If not turned in with paperwork may not pay
- **Parallel assessment of facilities are done by:**
  - Maintenance
    - Looks at maintenance department issues
  - Roofing
    - Looks at roofing issues
- **Photographic assessment**
  - For insurance documentation
  - Professional photographer
  - Black & white photographs are appropriate
  - Photograph all damage
    - Rooms
    - Walls & ceilings
    - Roof
    - Equipment
    - Site

- **Compiling information**
  - After volunteer, maintenance, & roof assessment teams have completed assignments
  - Team leaders of all assessment teams get together in one room to analyze results and determine when facilities can be open
  - Each team captain gives brief report & establishes time required to bring facility on line
  - Have flip chart prepared
    - One page per facility
      - Facility name
      - Damage assessment team
      - Roof assessment team
      - Maintenance assessment team
      - Space for time & points
    - Each team tells how long it will take to bring school on line. Assume full work force can be assigned to each facility
      - 2 weeks equal 5 points
      - 1 month equals 4 points
      - 3 months equal 3 points
      - 6 months equal 2 points
      - 1 year equals 1 point
      - Add up points and divide by 3 to obtain time required to bring facility on line
      - Time factors may depend when building can be dried in
- **Facilities with structural damage**
  - Follow up with structural engineer assessment
- **Facilities with disturbed asbestos**
  - Asbestos may be disturbed during the event
  - Asbestos may be blown in from neighboring facilities
- **Problems that may be encountered:**
  - If department heads do not show up, the department will not react to the situation
  - Team assessment of cost
    - Professionals from different areas of the state/country use different cost factors
    - Insert cost factors after assessment by district personnel
  - Assessment team photographs
    - Difference in quality and number of photographs from team to team
    - 35mm film must be developed before photographs can be identified. By that time team members have disappeared or have seen so many facilities that they cannot remember where photograph was taken.
      - Instant developing film solved this problem.
    - Photographs not properly identified. Team members disappeared, and corrections can not be made.

Problems that may be encountered (continued)

- Have professional photographs document for insurance purposes.
- Gasoline distribution
  - Fuel for transportation may not be obtained without going out of the way.
  - Find a way to make fuel available at the command center
- Food
  - Food ordered for assessment teams may not arrive until after the teams leave for their assigned facilities.

- **Determine alternate facilities that can be used for shelters or school functions**
  - Other facilities
  - Relocatables
    - May have to come from other areas
  - Tents
    - Large force of manpower required to set up
- **Determine when facility will be vacated as a shelter and turned back over to the school district/community college**
  - Mediator should be established between the district/community college and the American Red Cross to determine when facility will be vacated
  - Schools not returned to the district/community college until all sheltered people are moved out of the building
- **Clean up & repair from usage as shelter**
  - Debris
  - Human waste
  - Garbage
  - Destruction
- **Non-designated shelters may become shelters**
- **Other governmental agencies may take over school facilities**
  - Military took control of facilities when tent cities were established
- **By condemning residences, building officials forced people into needing shelters.**
- **Squatters took control of facilities**

- **Document everything prior to repairs being made or debris being removed**
  - For insurance and FEMA purposes
  - Keep detailed records of cost of repairs
    - Verify photographic evidence of damage is on file
    - Material cost
    - Materials used
    - Labor cost
      - Who, when, where
    - Photographs of completed work
- **Obtain waiver from DOE-Educational Facilities for advertising and bidding procedure**
  - DOE-Educational Facilities will not waive the following:
    - Insurance requirements
    - Building code compliance
    - Licensing of contractors/sub-contractors
- **Determine length of time temporary construction is to be warranted for.**
  - 6 months
  - 1 year
  - 18 months
- **Develop a plan for determining cost of temporary repairs:**
  - Work out cost per crew per day for 'x' number of units per day
  - For small items consider job-order contract for repairs
    - Develop base cost for materials & installation of building components
    - Contractor provides multiplier for base cost
  - Use independent estimator to determine reasonable cost for repairs/reconstruction
  - Budget for increase in labor & material charges
    - Prices have up & down cycle after the event
- **May have to work around a curfew**
- **Temporary roofs to dry in facilities**
  - Additional roof leaks may develop
- **Electrical recovery**
  - Turn all main breakers off
  - Turn all light/power panels off
  - Inspect all electrical equipment for water infiltration & other damage
    - Electrical panels
    - Luminaries
    - Other electrical equipment
  - Dry equipment as required
- **Maintenance crews should be coordinated from one central location**
- **Mitigate disturbed asbestos**
- **General contractors usually have a hard time finding sub-contractors**

- **Maintenance/construction supervisor**
  - Coordination of larger staff than usual
    - Military
    - Mutual aide
    - Volunteers
  - Outside help may try to do things their own way

DEMOGRAPHIC SHIFTS

- **Demographic shift causes:**
  - Heavily damaged areas
  - Repair of damaged areas
- **Shifts in population and students to:**
  - Non-damaged areas of districts/community colleges
  - Other school districts/community colleges
- **Loss of FTE**
  - Contact DOE to keep existing student base because of emergency
- **Try to contact families/students to get them back to school/community college**
- **Excess number of teachers under contract**
  - Reallocation of teaching personnel
- **Shift of personnel**
  - Increased travel distances
- **Loss of tax revenue due to devaluation of real estate**
  - Either cut services or raise property taxes
  - Will happen at an inopportune time
- **Capital programs affected by unknown**
  - Long-range projection of
    - Students
    - Revenues
    - Construction cost
- **Loss of commerce**
- **Loss of industry**
- **Bus routes may be revamped because of shifts in population**

- **Long term time frame**
- **Conduct forensic investigation to determine faulty construction**
- **Perform roof testing such as:**
  - To determine extend of water infiltration of roof deck
    - Infrared
    - Nuclear density test
  - Core drilling to determine composition and strength of existing roof deck
  - Uplift to determine structural uplift strength of existing roof deck
- **Identify secondary damage**
  - Roof leakage
- **Determine who is to pay for the updating of permanent construction**
  - New code requirements
  - Flood plain
  - Insurance coverages are available but must be requested
  - SREF will require replacement to be done in accordance with the code in effect at the time of the new construction.
- **Allow time to process construction documents through:**
  - Plan review process
  - FEMA
- **Bring in roofing manufacturers to reinstate roofing warranties.**
  - Existing roof warranties may be voided due to the event
- **State of Florida, Department of Management Services is available to administer construction contracts**
- **Existing construction contracts will be delayed**
  - Getting design teams back on line
  - Shift of construction personnel to damaged areas
  - Hard to locate sub-contractors to do work

- **Counseling for district/community college personnel**
  - Effects
    - Additional time off
    - Reduced productivity
    - Illness
      - Headaches
    - Memory loss
    - Violence
    - Short tempers 3-4 months later
    - Shock, confusion, denial
      - Anger sets in later
  - Teachers
    - May be worse off than students
    - Create familiar routine
    - Keep situations low key
    - Create morale boosters
    - Make them feel wanted
    - Be supportive of staff
  - Counseling facilitated through Employee Assistance Program
  - Immediate response
    - Obtain following information
      - Specific location of critical event
      - Estimated number of employees affected
      - Affected family members
      - Need of other language services
      - Need for alternate means of communication
        - Loss of telephone or electricity
    - Site liaison
      - Emergency team to determine appropriate site liaison
    - Contracted mental health consultants to provide:
      - On site individual or group critical debriefing and supportive counseling
    - Employee assistance team will:
      - Advise when and where services will commence
      - Visit site and discuss needs with:
        - Liaison
        - Employee(s)
        - Provider
      - Provide direct counseling assistance to employees as needed
      - Update superintendent of:
        - Actions taken
        - Services provided
        - Recommendations for needed additional services

Counseling for district/community college personnel (continued)

- For broader response
  - Deploy members of Crisis Response Volunteer Network
  - Mobilize community mental health agencies and private practitioners
  - Provide immediate individual and family counseling and stabilization
  - Should be paid for from employee insurance coverage
- Long term response
  - Identify employees who require:
    - On-going assistance
    - Additional personnel services
      - Leaves
      - Transfers
  - Stress workshops and debriefing will continue to be provided as long as:
    - Employees require services
    - Site administrator identifies need

- **Counseling for students**
  - Illness
  - Increased absenteeism
  - Violence
    - Rapes
  - Suicide attempts
  - Young children have no mechanism to understand the event
    - Went from total security to anxiety
  - Flashbacks during subsequent thunder/rain/wind storms
  - Three levels of disaster
    - Level I: Impact on one school
      - Death of staff or student
    - Level II: Impacts more than one school
      - Tornado, major storm
    - Level III: Impacts large area
      - Hurricane, nuclear disaster
  - Level I Disaster
    - Provide
      - Coordination of services crisis care core teams, school psychologists, school social workers
      - Brief faculty on procedures for appropriate intervention with the students in crisis
      - Counseling/consultation
      - Evaluation process for measuring the effectiveness of the intervention strategies

Counseling for students (continued)

- Action steps
  - Members of the district crisis team visit the site to meet with the crisis care core team in order to assess the psychological and mental health needs.
  - Administration and district crisis team will meet with faculty to apprise school personnel of crisis intervention procedures and strategies for handling the students.
  - Mobilization of additional counseling personnel by crisis team to the school site.
    - To meet the existing need for counseling.
  - Members of the crisis team in conjunction with crisis care core team and other school level students services personnel will provide crisis counseling to the students impacted by the crisis.
  - Administration, crisis team and crisis core team will conduct a faculty meeting to apprise of current status of crisis needs and to provide additional strategies for handling the students in crisis.
  - Administration, crisis team and crisis core team will meet to review process and continued needs to be addressed.
- Level II Disaster
  - Services/Programs to be provided
    - Coordination of services by psychological services and crisis intervention (school psychologists, school social workers)
    - Briefing faculties on procedures for appropriately intervening with the students in crisis
    - Counseling and consultation
    - Debriefing sessions
  - Action Steps
    - Implementation of steps found in Level I above
    - Crisis team will contact outside resources
    - Areas will be contacted by student services or psychological services administrators to release student services/ psychological services staff to be assigned in all schools impacted as soon as possible after disaster.
    - The crisis team will conduct a needs assessment of students impacted.
    - Psychological services and crisis team in conjunction with the crisis care core teams will revise coordination of services based on needs.
    - Student services and psychological services will provide support consultation to students, school psychologists, school social workers, staff

Counseling for students (continued)

- Level III Disaster
  - Services/programs to be provided
    - Coordination of services by psychological services and crisis intervention (school psychologists, school social workers)
    - Brief faculties on procedures for appropriately intervening with the students in crisis
    - Counseling and consultation
    - Debriefing sessions
  - Action steps
    - Implementation of steps found in Level I above
    - Coordination of activities and interventions with outside agencies will be completed by student services and psychological services

- **Psychological recovery after the disaster**
  - Correlates with socioeconomic status
    - Healthy educated middle class are challenged
    - Marginally functional segments were overwhelmed
  - Predictable disasters (hurricanes) do not have the same types of emotional trauma and psychiatric need that arises from other types of disasters
  - Clinical aide must be taken to the populations natural gathering places
  - Victims go through a stage of denial before facing their losses
  - Repeated discussion and reliving of the emotional trauma helps people master their anxiety and depression without individualized professional attention
  - High spirited volunteers important to victims
    - Otherwise morale declines & is replaced with:
      - Anger
      - Bitterness
      - Despondency

- **Power outages contributed to post-storm distress of homeowners and businesses.**

- **Of the event and its effect.**
- **What caused damage?**
  - How can corrections be made?
- **What worked in the system?**
- **What did not work?**
  - How can it be made to work?
- **What should be changed?**

APPENDIX A FORMS

- Shelter Organizational Chart 63
- Damage Assessment Form 65
- School Damage Assessment Flip Chart 67
- Damage Repair Estimate Form 69
- Cost Reimbursement Forms 71
  - Cost Reimbursement Forms Instructions for Completion
  - Cost Reimbursement Form
  - Cost Reimbursement - Labor Record
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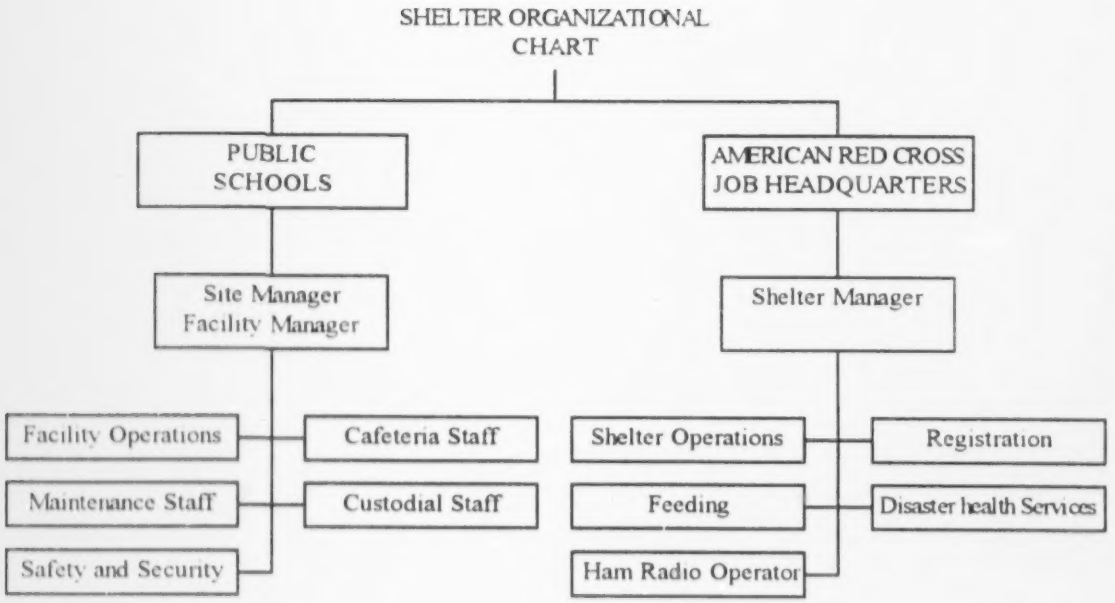
  - Cost Reimbursement - Materials Record
  - Cost Reimbursement - Contracts Record
  - Cost Reimbursement - Rental Equipment Record
  - Reimbursement Form - Force Account Record
- Sample of FEMA Numeric Cost Code Listing 89

APPENDIX A

SHELTER ORGANIZATIONAL CHART



DAMAGE ASSESSMENT FORM

DATE/TIME: _____

FACILITY NAME: _____ **FACILITY ADMIN. NO.** _____

TEAM MEMBERS:

Name	Title	Day Time Phone Number

CAN FACILITY OPEN AS IS? YES NO

Estimated time required for repairs?
1 wk. 2 wks. 1 mo. 3 mo. 6 mo.
1 yr. Over 1 year

Phone LIFE THREATENING items Immediately to: _____

FACILITY ASSESSMENT Amount of Damage. (Circle one)

1. Site Access	A. Okay	B. Hazardous	C. Not Accessible	
2. Site Damage	A. None	B. Minor	C. Hazardous	
3. Structural Damage	A. None	B. Minor	C. Major	
4. Door /Windows	A. None	B. Less than 25%	C. More than 25%	
5. Interior Partitions	A. None	B. Minor	C. Major	
6. Ceiling	A. None	B. Minor	C. Major	
7. Interior Debris Removal	A. None	B. Minor	C. Major	
8. Flooding	A. None	B. Interior	C. Exterior	
9. Roofs	A. Water Tight	B. Minor	C. Major	
10. Water / Sewer	A. Operable	B. Inoperable		
11. Lift Stations	A. Operable	B. Inoperable		
12. Gas/Kitchen	A. Okay	B. No pilot light	C. Gas pipe	
13. Air Conditioning	A. Operable	B. Inoperable		
14. Electricity	A. Okay	B. Partial	C. No Power	
15. Fire Alarm	A. Operable	B. Inoperable		
16. Intercom	A. Operable	B. Inoperable		
17. Phones	A. Operable	B. Inoperable		
18. Relocatables	A. Okay	B. Minor	C. Major	

AREAS OF CONCERN _____

_____

_____ continue on other side ☐

NAME OF SCHOOL_____

TEAM	TIME REQUIRED TO REPAIR FACILITY	ASSIGNED POINTS
DAMAGE ASSESSMENT		
MAINTENANCE		
ROOFING		
	POINT TOTAL	
	AVERAGE POINTS	

Create this form on a 24" x 36" paper flip chart with markers. As assessment team leaders discuss each facility, fill in estimated time to repair facility. Assign points as follows: 1 week = 6 points, 2 weeks = 5 points, 1 month = 4 points, 3 months = 3 points, 6 months = 2 points, 1 year plus = 1 point. Add up points and divide by 3 to obtain average points.

DAMAGE REPAIR ESTIMATE FORM

DATE: _____

FACILITY NAME: _____ FACILITY ADMIN.. NO. _____

BLDG. NO.	ROOM NO.	DESCRIPTION OF WORK	NUMBER OF UNITS	UNIT OF MEASURE	UNIT COST	REPAIR COST

State of Florida
Department of Community Affairs
Division of Emergency Management

COST REIMBURSEMENT FORMS
INSTRUCTIONS FOR COMPLETION

*NOTE: The forms provided in this package may be used by applicants and/or providers to document the cost of response and/or recovery from an incident or disaster. Individuals may chose to use their own software or forms, which is acceptable as long as the required information is provided.

When completing the summary sheets and providing the documentation it is important to remember that there will be inspectors performing the review who are not familiar with your jurisdiction's format. Therefore, it is imperative for the information to be provided in a format which anyone can pick it up and to track the data. Failure to follow this advice will most likely result in a DSR being suspended by the reviewing inspector pending further documentation or clarification, therefore delaying your reimbursement. The same format shall be followed in non-declared events when seeking some form of reimbursement.

These instructions are in reverse order as you will build the package from the bottom up.

All Forms, as applicable

Top -
Applicant: Fill in the name of the eligible applicant or responding party.
Location of Work: The city or county the crews were assigned to.
Description of Work: Give a simple description, such as Debris removal or Search and Rescue.
Page: Indicate the page number of how many pages.
Time Period: Indicate the beginning and ending dates assigned.
The FEMA DR is the federal declaration number if known and so declared, the categories are A through G, consult technical assistance if not known. Leave the DSR number line blank, it will be issued once the package has been approved.
Job Site Number: If a job site number was issued so indicate.

Bottom -
Certified By: Usually signed by the supervisor who responded with the crews and list their title.

Daily Work Sheets (Force Account)
A daily work record is the initial basis for all force account documentation, that is, the work performed by the applicant's own resources. Each project or individual site of a project will have costs associated such as labor, equipment hours and materials purchased or used from stock to complete the scope of work.

Normally departments such as Public Works or Road and Bridge use daily work records on a

routine basis. A blank generic form is provided in this package for those agencies who do not have one. Be sure the employee or supervisor who fills out the daily records indicate the amount

of time spent by each individual and which piece of equipment they were assigned on that site. The person who fills out the record is the one who signs it certifying that it is correct. The property number for each piece of equipment used shall be documented. List all major supplies or materials used such as a "30' section of corrugated metal pipe."

Place the completed daily work records on the very bottom of the force account DSR package as they support the entire package.

Rental Equipment Record Copies of the rental agreements, invoices and purchase orders should be attached behind the summary sheet. The rental agreement usually states the minimum number of days required along with the dates picked up and returned.

A statement of why the rental of a piece of equipment was necessary should be included in the package. As an example: "The mission required the use of a jack hammer drill, which was not available, to place tent spikes into an asphalt taxiway at the municipal airport to support staging activities."

Contract Record During response or recovery missions it may be necessary to utilize contracted services. Copies of the contract document along with invoices should be attached to the Contract Record sheet. A statement should be included explaining how the selection process was conducted, ie. phone quotes, sealed bids, etc. Include in the same statement how the job was awarded to the successful contractor, "lowest bid," "local contractor capable of handling the project," or "currently under contract to provide services prior to the incident."

Materials Record
The materials record tracks the purchase of and/or items used from stock to fulfill the scope of work. All items listed shall be backed up at a minimum by a copy of the invoice. Most agencies today use purchase orders and requisitions, if so, copies should be provided.

If the item was pulled from stock, such as a section of pipe, so indicate on the summary sheet and list the price from the original purchase invoice. If it has been some time since the item was purchased, indicate the current cost of replacement and provide a written quote from the vendor who normally supplies the item.

There are several formulas to derive the cost for items such as fill dirt from ones own pit and so forth. These should be handled on a case by case basis with the state inspectors.

Equipment Record Information pertaining to each piece of equipment is summarized from the daily work records. The make and model along with the property number should be listed. Indicate the FEMA cost code from the list associated with that make and model or size class. If the agency uses their own cost codes it should be so noted on the bottom of the sheet.

If the agency elects to use it's own equipment rates, the rates shall be equal to or less than those allowed in the FEMA cost codes unless prior approval was received from FEMA. Provide a copy of the local cost codes when used.

If the piece of equipment is not listed in the FEMA cost codes the agency may obtain either the hourly, daily or weekly rental rates from three of the closest vendors to the incident area and average the cost. Full documentation of the methodology and vendors should be included in the

package.

If the rental avenue is not available the agency may take the current purchase price of the piece of equipment, the normal life span as provided by the manufacturer, and divide out what the daily cost would be. Add in the average hourly cost for fuel and maintenance. Even though this method is somewhat involved, it may be the only possible way to come up with a rate that is fair to all parties.

No matter what rate method is used do not charge out separately for fuel, oil and maintenance, these costs are built into the hourly rate.

Force Account Labor (Labor Record) The form summarizes the assisting party's labor costs as documented from the employee time sheets and daily work records. The job class is that in which the employee was working, such as Paramedic, Heavy Equipment Operator, etc. List the actual number of hours the employee worked on that given date on that specific project. If the employee has run into overtime due to hours not associated with the project, so indicate in a written statement and attach to the package. All hours worked are to be backed up with copies of the time sheets for the pay periods in which the hours occurred.

Normally, only overtime hours are allowed for reimbursement for emergency and temporary work, categories A and B. Under such situations as mutual aid, one party is requested to respond from outside the incident area to assist they are considered to be a vendor. This concept allows for the reimbursement of both regular and overtime hours. This is predicated on the fact that the incident in no way affected the responding party's jurisdiction and ordinarily would have no obligation to respond and are therefore considered to be an outside resource.

In cases of permanent restorative work, categories C through G, all hours are eligible for reimbursement to both the impacted applicant and outside assistance.

Fringe benefits provided to the employees of the assisting party are reimbursable. Examples include FICA, Medicare, retirement contributions, workman's compensation insurance costs and others. There are two ways to charge out fringe benefits.

The first, which is the most common, is to calculate the entire labor sheet using the regular and overtime rates across the board, then multiply the total labor costs at the bottom of the page by the fringe percentage. The calculated fringe cost is then added to the total labor cost to give the sum total for the page.

Example: The total labor cost is $29,350. for regular and overtime. The fringe rate is 29.25% for FICA, Medicare and retirement. Multiply the $29,350 by 29.25% and add the two together equals $37.934., which is the sum total cost for the labor provided for that period.

The second method is where the fringe benefit rate is added into the hourly rate for both regular and overtime. The total amount for salary and fringe is indicated at the end of each line.

Example: A deputy sheriff makes $15.00 per hour. The cost of FICA, Medicare and high risk retirement is 36.20%. Multiply the $15.00 per hour by 36.20% equals a regular rate of $20.43 per hour.

The advantage to using the hourly rate plus fringe method is when there are several employees of different fringe rates involved. If the fringe percentage rate was not added in to the hourly rate there would be many different percentages and other marking on the page which leads to confusion.

Attached a statement sheet to the labor package breaking out what the fringe items are and their percentages.

Cost Reimbursement Summary Sheet Total all sheets for each section (labor, equipment, etc.) and indicate the amount, then add the sum total and enter the amount at the bottom of the left hand column. The supervisor signs the form. Do not mark in the center or right hand sections. This area is for the inspectors to complete upon review of the package.

This form is placed on top of the entire completed package.

Administrative Issues When preparing a package for mutual aid response reimbursement include a copy of the request for assistance that is sent by the State Emergency Operations Center authorizing the response. Also include a letter addressed to the requesting party briefly describing the response and requesting reimbursement for expenses incurred.

All applicants should include a copy of the section of the personnel policy that address overtime pay, compensations and other written guidelines which are a part of the normal practice of the applicant to back up why some things are charged out in a certain fashion.

Technical assistance is available through the State of Florida, Department of Community Affairs, Division of Emergency Management.

April 5, 1996

FLORIDA RESPONSE AND RECOVERY
WORK COMPLETED TO DATE SUMMARY SHEET
COSTS REIMBURSEMENT

FEMA _____ DR _____ P.A. I.D.# _____ Category: _____ DSR #: _____

APPLICANT NAME: _____ Time Period: _____ to _____

	Claimed Cost	Comments (For Inspector Use Only)	Eligible Cost
F.A. LABOR			
F.A. EQUIPMENT			
MATERIALS			
RENTAL EQUIPMENT			
CONTRACT COST			
TOTAL:			

I certify that the above information was furnished from time sheets, equipment logs, invoices, stock records or other documents available for audit

Certified By: _____ **Title:** _____

Applicants records have been reviewed and found correct with the exceptions as noted:

Inspector: _____ **Inspector:** _____

FLORIDA RESPONSE AND RECOVERY
COSTS REIMBURSEMENT - LABOR RECORD

Applicant _____ Page _____ of ___ page(s)

Location of Work: _____ Time period: _____ to

Description of Work: _____ _____ 19 _____

FEMA _____ DR _____ Category of Work _____ DSR No. _____ Job Site Number: _____

NAME	JOB CLASS	DATE / HOURS WORKED EACH DAY										TOTAL HOURS	RATE	TOTAL PAY
		DATE												
		REG												
		O/T												
		REG												
		O/T												
		REG												
		O/T												
		REG												
		O/T												
		REG												
		O/T												
		REG												
		O/T												
		REG												
		O/T												

I certify that the above information was transcribed from time sheets, payroll records, or other documents which are available for audit.

Reg.		Reg.	
O/T		O/T	
Total		Fringe	
		Total	

Certified By: _____ **Title:** _____

Fringe Benefits: Reg. Time: _____ %

Overtime _____ % **or, Included in Hourly Rate:** ____ ____

Yes **No** (If fringe is included in hourly rate, do not include to right.)

FLORIDA RESPONSE AND RECOVERY
COSTS REIMBURSEMENT - EQUIPMENT RECORD

Applicant _____ Page _____ of ____ page(s)

Location of Work: _____ Time period: _____ to

Description of Work: _____ _____ 19 _____

FEMA _____DR _____ Category of Work_____ DSR No._____ Job Site Number: _____

Type of Equipment Include Make and Model	FEMA Cost Code	DATE / HOURS WORKED EACH DAY										TOTAL HOURS	RATE	COST
	Hours	DATE												
	Hours													
	Hours													
	Hours													
	Hours													
	Hours													
	Hours													
	Hours													
													Total Cost	

I certify that the above information was transcribed from daily logs or other documents which are available for audit.

Certified By: _____ **Title:** _____

FLORIDA RESPONSE AND RECOVERY
COSTS REIMBURSEMENT - MATERIALS RECORD

Applicant _____ Page _____ of _____ page(s)

Location of Work: _____ Time period: _____ to

Description of Work: _____ _____ 19 _____

FEMA _____ DR _____ Category of Work _____ DSR No. _____ Job Site Number: _____

Vendor	Item	Quan.	Unit Price	Date Bought	Invoice Number	Date Used	Total Cost	Info From Invoic	Info From Stock
						Total			

I certify that the above information was transcribed from daily logs or other documents which are available for audit.

Certified By: _____ **Title:** _____

FLORIDA RESPONSE AND RECOVERY
COSTS REIMBURSEMENT - CONTRACT RECORD

Applicant _____ Page _____ of _____ page(s)

Location of Work: _____ Time period: _____ to

Description of Work: _____ _____ 19 _____

FEMA _____DR _____ Category of Work _____DSR No: _____ Job Site Number: _____

Contractor	Item(s)	Date Paid	Invoice Number	Cost

*Each Contractor may have more than one payment, list each payment separatly. Total

I certify that the above information was transcribed from contractor invoices, draws or other documents which are available for audit.

Certified By: _____ **Title:** _____

FLORIDA RESPONSE AND RECOVERY
COSTS REIMBURSEMENT - RENTAL EQUIPMENT RECORD

Applicant _____ Page _____ of _____ page(s)

Location of Work: _____ Time period: _____ to

Description of Work: _____ _____ 19 _____

FEMA _____ DR _____ Category of Work _____ DSR No. _____ Job Site Number: _____

TYPE OF EQUIPMENT Indicate size, capacity, horsepower, make, and model as appropriate	DATE & HOURS USED	RATE PER HOUR W/ OPR	RATE PER HOUR W/O OPR	TOTAL COST	VENDOR	INVOICE NO.	DATE & AMOUNT PAID	CHECK NO.
			Total					

I certify that the above information was transcribed from daily logs, invoices or other documents which are available for audit.

Certified By: _____ **Title:** _____

FLORIDA RESPONSE AND RECOVERY
REIMBURSEMENT FORM - FORCE ACCOUNT RECORD

Applicant: _____ FEMA _____ DR _____ Category: _____
Location of Work: _____
Description of Work: _____ DSR No: _____ Job Site Number: _____

Name	Job Class	Labo	Dates									Total Hours	Rate	Total Pay
		Reg.												
		O.T.												
		Reg.												
		O.T.												
		Reg.												
		O.T.												

Types of Equipment	FEMA Cost Code	Dates										Total Hours	Rate	Total Cost

Vendor	Materials	Description	Date Bought	Date Used	Info from Invoice	Info from Stock	Quanitity	Unit Cost	Total Price

Total Material: _____
Site Cost: _____

I certify that the above information was obtained from invoices, stock records or other documents available for audit.

Certified By: _____ **Title:** _____

DATE: 09/06/95
TIME: 08:50AM

FEDERAL EMERGENCY MANAGEMENT AGENCY

G.2 - NUMERIC COST CODE

RANGE: ALL
REGION: 04
STATE: FL

REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	0000	CARPET REMOVAL	SY	$1.00
*** CATEGORY A ***						
04	FL	000	1010	DEBRIS (SEDIMENTS, CONCENTRATED)	CY	$6.50
04	FL	000	1011	DEBRIS (SEDIMENTS, SCATTERED)	CY	$5.00
04	FL	000	1012	DEBRIS (PERSONAL PROPERTY CURB)	CY	$3.00
04	FL	000	1013	DEDUCT NORMAL WEEKLY GARBAGE PICKUP CHARGE	LS	$.00
04	FL	000	1014	DEBRIS (TREES & LIMBS, CONCENTRATED)	CY	$6.00
04	FL	000	1015	DEBRIS (TREES & LIMBS, SCATTERED)	CY	$7.00
04	FL	000	1016	DEBRIS (WINDBLOWN TREES ALONG ROW-MAXIMUM DENSITY)	MI	$5,000.00
04	FL	000	1020	DEBRIS (WATERWAY STRUCTURE)	CY	$8.00
04	FL	000	1021	DEBRIS (TREE, CUT TRUNK 2-8')	EA	$20.00
04	FL	000	1022	DEBRIS (TREES, CUT TRUNK 8-20')	EA	$30.00
04	FL	000	1030	DEBRIS (TREES 8-18")	EA	$50.00
04	FL	000	1031	DEBRIS (TREES 19-36")	EA	$100.00
04	FL	000	1032	DEBRIS (TREES 37" ABOVE)	EA	$170.00
04	FL	000	1033	DEBRIS (HAZARD TREE LIMBS/PER TREE)	EA	$20.00
04	FL	000	1034	DEBRIS (TREES, CUT & CHIP 6")	EA	$50.00
04	FL	000	1035	DEBRIS (TREES, CUT & CHIP 8-12")	EA	$75.00
04	FL	000	1036	DEBRIS (TREES, CUT & CHIP 14-24")	EA	$125.00
04	FL	000	1037	DEBRIS (TREES, CUT & CHIP 19-36")	EA	$200.00
04	FL	000	1038	DEBRIS (CHIP)	CY	$2.00
04	FL	000	1039	DEBRIS (BURN)	CY	$1.50
04	FL	000	1040	DEBRIS STUMPS ONLY (8-18" DIAMETER)	EA	$23.00
04	FL	000	1041	DEBRIS STUMPS ONLY (19-36" DIAMETER)	EA	$28.00
04	FL	000	1042	DEBRIS STUMPS ONLY (37-55" DIAMETER)	EA	$38.00
04	FL	000	1043	DEBRIS STUMPS ONLY (55" & ABOVE DIAMETER)	EA	$50.00
04	FL	000	1044	DEBRIS (STUMP GRINDING DIA/IN)	IN	$2.00
04	FL	000	1050	DUMP CHARGES (BURN - BURY)	CY	$.00
04	FL	000	1051	DUMP CHARGES (LANDFILL DISPOSAL)	CY	$2.50
04	FL	000	1052	DUMP CHARGES (LANDFILL DISPOSAL)	TON	$4.00
04	FL	000	1053	DUMP CHARGES	LS	$.00
04	FL	000	1060	DEBRIS CONTAINERS (W/O DUMP CHARGES) 2 CY PER PICKUP	EA	$5.00
04	FL	000	1061	DEBRIS CONTAINERS (W/0 DUMP CHARGES) 3 CY PER PICKUP	EA	$7.50
04	FL	000	1062	DEBRIS CONTAINERS (W/0 DUMP CHARGES) 4 CY PER PICKUP	EA	$10.00
04	FL	000	1063	DEBRIS CONTAINERS (W/O DUMP CHARGES) 8 CY PER PICKUP	EA	$20.00
04	FL	000	1064	DEBRIS CONTAINERS (W/O DUMP CHARGES) 20 CY PER PICKUP	EA	$155.00
04	FL	000	1065	DEBRIS CONTAINERS (W/O DUMP CHARGES) 30 CY PER PICKUP	EA	$165.00
04	FL	000	1066	DEBRIS CONTAINERS (W/O DUMP CHARGES) 40 CY PER PICKUP	EA	$175.00
04	FL	000	1067	DEBRIS CONTAINERS (W/O DUMP CHARGES) 50 CY PER PICKUP	EA	$175.00
04	FL	000	1070	DEBRIS (SANDBAGS - MACHINE LOAD)	CY	$.00
04	FL	000	1071	DEBRIS (SANDBAGS - HAND LOAD)	CY	$1.50
04	FL	000	1080	DEBRIS (FLOATABLE ON LEVEE)	MI	$400.00
04	FL	000	1090	DEBRIS (EARTH FILL - LEVEE)	CY	$2.50
04	FL	000	1100	DEBRIS (SMALL ROAD SLIDE),INCL HAUL	CY	$3.00
04	FL	000	1110	DEBRIS (CHANNEL EXC. WITH SPOIL BANK)	CY	$.75
04	FL	000	1111	DEBRIS (CHANNEL EXC. W/HAUL)	CY	$4.00
04	FL	000	1112	DEDUCT APPLICANT'S SHARE (SPOIL BANK)	CY	$.00
04	FL	000	1113	DEDUCT APPLICANT'S SHARE (HAUL)	CY	$.00
04	FL	000	1120	DEMOLITION (RESIDENTIAL STRUCTURE ONLY)	SF	$.35
04	FL	000	1121	DEMOLITION (COMMERCIAL STRUCTURE ONLY)	SF	$.45
*** CATEGORY B ***						
04	FL	000	2010	POLICE OVERTIME	HR	$.00
04	FL	000	2011	FIRE OVERTIME	HR	$.00
00	00	000	2012	TEMPORARY EMPLOYEES	HR	$.00
04	FL	000	2020	POLYETHYLENE	SF	$.03
04	FL	000	2025	PLYWOOD SHEETING, ½"	SF	$.65

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REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	2030	SANDBAGS (PURCHASED)	EA	$.30
04	FL	000	2040	SAND (DELIVERED)	CY	$8.00
04	FL	000	2045	SANDBAGS, FILLED & PLACED	CY	$50.00
04	FL	000	2050	LEVEE, EMERGENCY REPAIR (FILL)	CY	$4.00
04	FL	000	2060	LEVEE, EARTHEN	CY	$6.00
04	FL	000	2070	TOWING - VEHICLES	EA	$25.00
04	FL	000	2080	TOWING AND WINCHING, WRECKER TRUCK	HR	$.00
04	FL	000	2081	BARRICADES (PLACE & REMOVE): SIGNS	EA	$30.00
04	FL	000	2082	BARRICADES: RENTED SIGNS	EA	$.00
04	FL	000	2090	PUMPS (3")	HR	$.00
04	FL	000	2091	PUMPS (4")	HR	$.00
04	FL	000	2092	PUMPS (6")	HR	$.00
04	FL	000	2093	PUMPS (8")	HR	$.00
04	FL	000	2094	PUMPS (10")	HR	$.00
04	FL	000	2095	PUMPS (12")	HR	$.00
04	FL	000	2110	PUMP COSTS FOR EMERGENCY PHASE	LS	$.00
04	FL	000	2111	DEDUCT 3 YR. AVG. PUMPING COSTS (SAME PERIOD)	LS	$.00
04	FL	000	2112	PUMP OPERATORS (AVG. REGULAR TIME)	HR	$.00
04	FL	000	2113	PUMP OPERATORS (AVG. OVERTIME)	HR	$.00
*** CATEGORY C ***						
04	FL	000	3009	AGGREGATE SURFACE COURSE (LIMEROCK)	CY	$27.00
04	FL	000	3010	AGGREGATE SURFACE COURSE (PIT RUN)	TON	$.00
04	FL	000	3011	AGGREGATE SURFACE (115 LBS/SY)	CY	$.00
04	FL	000	3012	AGGREGATE SURFACE (CRUSHED RUN)	TN	$.00
04	FL	000	3013	AGGREGATE SURFACE	MI	$1,000.00
04	FL	000	3014	SHELL SURFACE COURSE (1650 LBS/CY)	CY	$14.00
04	FL	000	3015	SHELL SURFACE (7.75/TON)	TN	$16.50
04	FL	000	3018	FILL (SAND)	CY	$8.00
04	FL	000	3019	FILL (CLASSIFIED)	CY	$6.00
04	FL	000	3020	FILL (UNCLASSIFIED)	CY	$4.00
04	FL	000	3030	LOCAL BORROW (MATERIAL ONLY)	CY	$4.50
04	FL	000	3040	BACKFILL (GRANULAR)	CY	$6.00
04	FL	000	3050	EXCAVATION ~ BACKFILL (SMALL UNCLASSIFIED)	CY	$3.00
04	FL	000	3051	ROCKFILL (ALT. TO UNCLASSIFIED FILL)	CY	$5.00
04	FL	000	3060	GRADING (SUBGRADE SHAPING)	SY	$.50
04	FL	000	3061	SCARIFYING	SY	$.70
04	FL	000	3070	DITCH CLEANING & SHAPING	LF	$.12
04	FL	000	3071	EXCAVATION LATERAL	LF	$2.40
04	FL	000	3072	EXCAVATION LATERAL	CY	$3.50
04	FL	000	3080	CHIP AND SEAL (SINGLE) (BST)	SY	$1.00
04	FL	000	3081	CHIP AND SEAL (DOUBLE) (DBST)	SY	$1.50
04	FL	000	3082	CHIP AND SEAL (TRIPLE)	SY	$2.50
04	FL	000	3090	AGGREGATE BASE COURSE (UNDER BITUMINOUS) LIMEROCK	TON	$25.00
04	FL	000	3091	AGGREGATE BASE COURSE (UNDER BITUMINOUS) LIMEROCK	CY	$26.00
04	FL	000	3100	BITUMINOUS COLD PATCH	SY/IN	$12.00
04	FL	000	3101	BITUMINOUS COLD PATCH (MATERIAL ONLY)	TON	$30.00
04	FL	000	3110	BITUMINOUS CONCRETE OVERLAY/INCH	SY	$2.25
04	FL	000	3120	BITUMINOUS CONCRETE BINDER CASE (MATERIAL ONLY)	TON	$28.00
04	FL	000	3130	BITUMINOUS CONCRETE SURFACE	TON	$40.00
04	FL	000	3150	PAVEMENT REMOVAL (BIT)	SY	$3.50
04	FL	000	3151	PAVEMENT REMOVAL (CONC)	SY	$12.00
04	FL	000	3160	CONCRETE SIDEWALK (4")	SF	$3.35
04	FL	000	3170	CONCRETE SIDEWALK REMOVAL	SF	$1.15
04	FL	000	3180	CONCRETE CURB AND GUTTER	LF	$7.25
04	FL	000	3190	CONCRETE CURB AND GUTTER REMOVAL	LF	$2.00
04	FL	000	3200	CONCRETE PAVEMENT (MESH REINFORCEMENT)	CY	$150.00
04	FL	000	3210	CONCRETE, CLASS X (IN PLACE FORMED)	CY	$350.00
04	FL	000	3215	CONCRETE, REINFORCED CLASS A (STRUCTURAL)	CY	$350.00
04	FL	000	3220	CONCRETE RETAINING WALLS (12")	SF	$12.00
04	FL	000	3230	CONCRETE BOX CULVERTS	SF	$35.00
04	FL	000	3240	CONCRETE SLAB BRIDGE (INTEGRAL ABUTMENT)	SF	$65.00
04	FL	000	3241	CONCRETE SLAB BRIDGE (VERTICAL ABUTMENT)	SF	$55.00
04	FL	000	3242	CONCRETE BRIDGE, PRECAST (UNDER 40')	SF	$45.00

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04	FL	000	3243	BRIDGE, CONCRETE PRECAST (CHANNEL OVER 40')	SF	$55.00
04	FL	000	3244	BRIDGE, BEAM (WITH EXISTING ABUTMENT)	SF	$35.00
04	FL	000	3250	RIP RAP, SLOPE PROTECTION (PLACED)	CY	$160.00
04	FL	000	3251	RIP RAP, SLOPE PROT (DUMPED)	CY	$8.00
04	FL	000	3252	RIP RAP, BAGGED ½ CU. FT./SACK (SAND-CEMENT)	EA	$3.00
04	FL	000	3260	CONCRETE SLOPE PROTECTION, 4" RE-BAR/TOE	SY	$22.00
00	00	000	3261	ROCK WALL	SF	$5.75
04	FL	000	3270	BRIDGE AND BOX CULVERT REMOVAL	SF	$10.00
04	FL	000	3271	CONCRETE AND MASONRY REMOVAL	CY	$45.00
04	FL	000	3280	BRIDGE, WOOD AND BEAM, REMOVAL	SF	$8.00
04	FL	000	3290	TREATED TIMBER (FOB)	MBF	$945.00
04	FL	000	3291	TIMBER, TREATED, IN PLACE	MBF	$1,000.00
04	FL	000	3292	BRIDGE, TREATED TIMBER, IN PLACE	SF	$.00
04	FL	000	3293	BRIDGE RAILING (APPROACH)	LF	$18.00
04	FL	000	3294	BRIDGE RAILING (BRIDGE ITSELF)	LF	$35.00
04	FL	000	3300	EXCAVATION, STRUCTURAL	CY	$15.00
04	FL	000	3310	BACKFILL, STRUCTURAL, COMPACTED	CY	$15.00
04	FL	000	3320	BEDDING MATERIAL (SELECT GRANULAR)	CY	$16.00
04	FL	000	3330	PILING (TREATED TIMBER) FURN. & DR.	LF	$18.00
04	FL	000	3331	PILING (STEEL SHEET) FURN & DR (LEFT IN PLACE)	LF	$85.00
04	FL	000	3332	PILING (H-BEAM) FURN. & DR. 10"	LF	$35.00
04	FL	000	3333	PILING (RAILROAD RAILS)	LF	$.00
04	FL	000	3334	PILING, CONCRETE 12"-16" PRESTRESSED	LF	$16.00
04	FL	000	3340	CULVERT, RELAY (SALVAGE 12" - 48") ONLY	LF	$20.00
00	00	000	3350	CMP 8" (FURNISH AND INSTALL)	LF	$13.00
04	FL	000	3351	CMP 12" (NO FILL)	LF	$25.00
04	FL	000	3352	CORREGATED METAL PIPE 15"	LF	$28.00
04	FL	000	3353	CORREGATED METAL PIPE 18"	LF	$31.00
04	FL	000	3354	CORREGATED METAL PIPE 24"	LF	$35.00
04	FL	000	3355	CMP 30" (FURNISH AND INSTALL)	LF	$71.00
04	FL	000	3356	CORREGATED METAL PIPE 36"	LF	$43.00
04	FL	000	3357	CORREGATED METAL PIPE 42"	LF	$49.00
04	FL	000	3358	CORREGATED METAL PIPE	LF	$53.00
04	FL	000	3359	CORREGATED METAL PIPE 54"	LF	$59.00
04	FL	000	3360	CORREGATED METAL PIPE 60"	LF	$65.00
04	FL	000	3361	CORREGATED METAL PIPE 72"	LF	$90.00
04	FL	000	3362	CORREGATED METAL PIPE 96"	LF	$150.00
04	FL	000	3363	CORREGATED METAL PIPE 108"	LF	$160.00
04	FL	000	3364	CORREGATED METAL PIPE 120"	LF	$170.00
04	FL	000	3365	CORRUGATED STRUCTURE PLATE PIPE ARCH (96")	LF	$.00
04	FL	000	3366	REINFORCED CONCRETE PIPE 12"	LF	$26.00
04	FL	000	3367	REINFORCED CONCRETE PIPE 18"	LF	$29.00
04	FL	000	3368	REINFORCED CONCRETE PIPE 24"	LF	$38.00
04	FL	000	3369	REINFORCED CONCRETE PIPE 30"	LF	$45.00
04	FL	000	3370	REINFORCED CONCRETE PIPE 36"	LF	$56.00
04	FL	000	3371	REINFORCED CONCRETE PIPE 42"	LF	$77.00
04	FL	000	3372	REINFORCED CONCRETE PIPE 54"	LF	$109.00
04	FL	000	3373	REINFORCED CONCRETE PIPE 60"	LF	$133.00
04	FL	000	3374	REINFORCED CONCRETE PIPE 72"	LF	$188.00
04	FL	000	3375	REINFORCED CONCRETE PIPE 84"	LF	$302.00
04	FL	000	3376	REINFORCED CONCRETE PIPE 96"	LF	$340.00
04	FL	000	3377	REINFORCED CONCRETE PIPE 108"	LF	$375.00
04	FL	000	3380	RCP 12" END SECTIONS	EA	$350.00
04	FL	000	3381	RCP 15" END SECTIONS	EA	$434.00
04	FL	000	3382	RCP 18" END SECTIONS	EA	$550.00
04	FL	000	3383	RCP 24" END SECTIONS	EA	$785.00
04	FL	000	3384	RCP 30" END SECTIONS	EA	$985.00
04	FL	000	3385	RCP 36" END SECTIONS	EA	$1,350.00
04	FL	000	3386	RCP 48" END SECTIONS	EA	$1,800.00
04	FL	000	3387	RCP 60" END SECTIONS	EA	$2,200.00
04	FL	000	3390	TOPSOIL AND SEEDING (HYDR.)	SY	$.70
04	FL	000	3391	TOPSOIL, IN PLACE (CONTRACT FURNISHED)	CY	$5.25
04	FL	000	3392	MULCH	TN	$125.00
04	FL	000	3393	SEEDING	AC	$300.00
04	FL	000	3394	FERTILIZER	TN	$290.00

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04	FL	000	3400	SIGNING, PERMANENT (W/GALVANIZED POSTS)	SF	$13.25
04	FL	000	3410	GUARD RAIL, STEEL PLATE BEAM	LF	$18.00
04	FL	000	3411	GUARD RAIL REMOVAL	LF	$2.00
04	FL	000	3412	GUARD RAIL , CONCRETE (ON BRIDGE)	LF	$20.00
04	FL	000	3420	SIGNS, 48 X 24	EA	$250.00
04	FL	000	3421	SIGNS, 36 X 36 SCHOOL ADVANCE	EA	$300.00
04	FL	000	3422	SIGNS, 30 X 30 DEAD END/PEDES XING	EA	$165.00
04	FL	000	3510	ENGINEERING AND DESIGN SERVICES	LS	$.00
04	FL	000	3520	BRIDGE DECK SUPPORT, TEMPORARY	LS	$.00
04	FL	000	3910	SALVAGE, DEDUCT	LS	$.00
*** CATEGORY D ***						
04	FL	000	4010	LEVEE GRADING, SEEDING AND FERTILIZING	AC	$500.00
04	FL	000	4011	GRADING, SLOPE	SY	$2.50
04	FL	000	4020	FILL (UNCLASSIFIED)	CY	$6.00
04	FL	000	4030	FILL (COMPACTED CLAY)	CY	$6.00
04	FL	000	4040	FILL (GRANULAR)	CY	$5.00
04	FL	000	4050	CONCRETE, REINFORCED, REMOVAL	CY	$28.00
04	FL	000	4060	CONCRETE, REINFORCED (CLASS X)	CY	$350.00
04	FL	000	4061	CONCRETE HEAD WALL	SF	$18.00
04	FL	000	4062	CONCRETE WALL, PRECAST, REINF.	LF	$75.00
04	FL	000	4063	CONC WALL, PREC, REIN (4X8X1), ANCHOR	EA	$200.00
04	FL	000	4064	CONC WALL, PREC, REIN (4X8X1), ANCHOR	SF	$6.25
04	FL	000	4065	CONC SEAWALL (INCL CAP, ANCHOR, TIEBACK)(8"WX16'H)	LF	$300.00
04	FL	000	4066	CONC CAP (2'X1.33')	SF	$29.52
04	FL	000	4070	RIP RAP (DUMPED)	CY	$25.00
04	FL	000	4071	RIP RAP (DUMPED)	TN	$.00
04	FL	000	4080	RIP RAP (GROUTED)	CY	$70.00
04	FL	000	4081	RIP RAP (PLACED SLOPE PROTECTION)	CY	$50.00
04	FL	000	4082	RIP RAP (PLACED SLOPE PROTECTION)	TN	$.00
04	FL	000	4090	CONCRETE CHANNEL LINING (REINFORCED)	CY	$150.00
04	FL	000	4091	CHANNEL LINING, REINF CONC, 1 INCH	SY/IN	$6.00
04	FL	000	4100	GABIONS (ROCK & WIRE BASKETS)	CY	$85.00
04	FL	000	4101	GABION BASKET REMOVAL	CY	$3.00
04	FL	000	4110	FILTER BLANKET (PEA GRAVEL)	CY	$24.00
04	FL	000	4120	RIP RAP REPAIR OF FABRIC FILTER	CY	$.00
04	FL	000	4130	FILTER FABRIC	SY	$2.90
00	00	000	4140	AGGREGATE SURFACE MATERIAL	TON	$6.50
00	00	000	4141	AGGREGATE SURFACE MATERIAL	CY	$13.00
00	00	000	4150	AUGERING (DRAIN TILE)	LF	$.65
*** CATEGORY E ***						
04	FL	000	5010	DEBRIS, REMOVE FROM INTERIOR	SF	$.00
04	FL	000	5020	FLOOR, TILE, REMOVAL	SF	$.20
04	FL	000	5030	CARPET, REMOVE	SY	$.00
04	FL	000	5031	CARPET, REPLACE	SY	$18.00
04	FL	000	5040	CEILING TILE, ACOUSTICAL, 2X4'	SF	$.70
04	FL	000	5041	CEILING TILE, 12"X12" GLUED	SF	$.85
04	FL	000	5042	CEILING TILE, 12"X12" TACKED IN PL	EA	$.85
04	FL	000	5043	CEILING TILE, SUSPENDED	SF	$1.20
04	FL	000	5044	CEILING, SUSPENSION SYSTEM (W/O TILE)	SF	$1.20
04	FL	000	5050	FLOOR, VINYL, REPLACE	SF	$1.00
04	FL	000	5051	FLOOR, HARDWOOD/PARQUET, REPLACE	SF	$8.00
04	FL	000	5052	FLOOR, CUT/RENAIL HARDWOOD TONGUE-GROOVE	SF	$.40
04	FL	000	5060	FLOOR, TILE, REMOVE AND REPLACE	SF	$2.00
04	FL	000	5070	ROOF, BUILT UP, REPLACE (FELT, TAR, GRAVEL)	SQ	$80.00
04	FL	000	5071	ROOF, BUILT UP, 3-PLY W/GRAVEL, REPLACE	SQ	$160.00
04	FL	000	5072	ROOF, BUILT UP, 4-PLY W/FLASHING, REPLACE	SQ	$200.00
04	FL	000	5073	ROOF, BUILT UP, 4-PLY W/FLASH & INSUL.	SQ	$300.00
04	FL	000	5074	ROOF, ROLL W/FLASHING	SQ	$50.00
04	FL	000	5075	ROOF, METAL CORRUGATED STEEL GALV.	SQ	$85.00
04	FL	000	5076	ROOF, FIBERGLASS CORRUGATED PANELS	SQ	$250.00
04	FL	000	5077	ROOF CAP (RIDGE CAP), GALVANIZED	LF	$1.50

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REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	5078	ROOF DECKING, 1"X6"	LF	$.60
04	FL	000	5079	ROOF DECKING, ½" PLYWOOD	SQ	$20.00
04	FL	000	5080	SHINGLES, ASPHALT, REPLACE	SQ	$50.00
04	FL	000	5081	SHINGLES, FIBERGLASS	SQ	$80.00
04	FL	000	5082	SHINGLES, ASBESTOS	SQ	$185.00
04	FL	000	5083	SHINGLES, TERRA COTTA	SQ	$385.00
04	FL	000	5084	SHINGLES, CEDAR	SQ	$140.00
04	FL	000	5085	SHINGLES, SLATE	SQ	$250.00
04	FL	000	5090	FLASHING (ROOF EDGE),REPLACEMENT	LF	$4.00
04	FL	000	5091	FLASHING, VALLEY	LF	$2.00
04	FL	000	5092	FLASHING, WALL	LF	$1.15
04	FL	000	5093	FLASHING, PENETRATION (LEAD)	EA	$10.00
04	FL	000	5094	PURLINS, WOOD 1"X6"	LF	$.75
04	FL	000	5095	SHEETING, 1~2 PLYSCORE	SF	$.65
04	FL	000	5100	CLEAN BRICK SURFACE (SANDBLAST)	SF	$.12
04	FL	000	5110	CLEAN MASONRY (STEAM CLEAN)	SF	$.12
04	FL	000	5120	CLEAN CARPET	SF	$.12
04	FL	000	5130	CLEAN, DISINFECT & REPAIR METAL FURN	EA	$.00
04	FL	000	5140	ELECTRIC MOTOR REPAIR (½ HP)	EA	$.00
04	FL	000	5141	ELECTRIC MOTOR REPAIR (7-1/2 HP)	EA	$.00
04	FL	000	5142	ELECTRIC MOTOR REPAIR (15 HP)	EA	$.00
04	FL	000	5143	ELECTRIC MOTOR REPAIR (30 HP)	EA	$.00
04	FL	000	5150	FLOOR, HARDWOOD, SAND & REFINISH	SF	$1.00
04	FL	000	5160	WINDOW, PLATE GLASS	SF	$5.50
04	FL	000	5161	WINDOW, STORM	EA	$85.00
04	FL	000	5162	WINDOW SCREEN, 36" X 27"	EA	$15.00
04	FL	000	5163	WINDOW, WIRE SCREEN, ALUM	SF	$.85
04	FL	000	5164	WINDOW, WIRE SCREEN, GALVANIZED	SF	$.85
04	FL	000	5165	WINDOW, WIRE SCREEN, COPPER	SF	$2.15
04	FL	000	5170	DOORS (INTERIOR, HOLLOW CORE), REPLACE	EA	$85.00
04	FL	000	5171	DOORS (EXTERIOR W/CASING) REPLACEMENT	EA	$150.00
04	FL	000	5172	DOORS (OVERHEAD) REPLACE	EA	$1,500.00
04	FL	000	5173	DOORS (EXT. WOOD CORE W/O CASING)	EA	$69.00
04	FL	000	5174	DOOR, SCREEN, ALUMINUM	EA	$80.00
04	FL	000	5180	DRYWALL, REPLACE	SF	$.55
04	FL	000	5181	DRYWALL, REMOVAL (WALL)	SF	$.25
04	FL	000	5182	DRYWALL, REMOVAL (CEILING)	SF	$.45
04	FL	000	5183	DRYWALL, 3/8"X4X8(NO FINISH)	SF	$.70
04	FL	000	5184	DRYWALL, SEAL	SF	$.20
04	FL	000	5185	DRYWALL, PAINT, 2 COATS	SF	$.30
04	FL	000	5186	DRYWALL, ACOUSTICAL SPRAY FINISH	SF	$.45
04	FL	000	5187	DRYWALL, PLASTERING	SF	$24.00
04	FL	000	5188	DRYWALL, PLASTER REMOVAL	SY	$2.00
04	FL	000	5190	PANELING, REPLACE	SF	$.00
04	FL	000	5191	PATIO COVERS, ALUMINUM	SF	$3.00
04	FL	000	5192	SIDING, ALUMINUM (HORIZ) 7"	SF	$2.15
04	FL	000	5193	SIDING, ALUMINUM	SQ	$160.00
04	FL	000	5194	SIDING, VINYL	SQ	$.00
04	FL	000	5195	SIDING, VINYL	SF	$2.50
04	FL	000	5196	SIDING, SHIP LAP, PINE	SQ	$225.00
04	FL	000	5197	SIDING, BOARD & BATTEN	SQ	$230.00
04	FL	000	5198	SIDING, SOFFIT, WOOD (18" WIDE)	SQ	$250.00
04	FL	000	5199	SIDING, FASCIA BOARD	LF	$1.50
04	FL	000	5200	FLOORING, GYM, REPLACEMENT, ASH	SF	$.00
04	FL	000	5201	FLOOR, GYM, PARQUE, REPLACEMENT	SF	$.00
04	FL	000	5210	CARPET, REPLACE (INCL PAD)	SY	$18.00
04	FL	000	5220	FLOOR, TILE (VINYL) REPLACEMENT	SF	$1.50
04	FL	000	5230	WALL, MASONRY 8", REPLACE	SF	$.00
04	FL	000	5231	WALL, CONCRETE	SF	$2.00
04	FL	000	5232	WALL, STUCCO	SY	$10.00
04	FL	000	5240	FLOOR, CONCRETE (4") REPLACE	SF	$.00
04	FL	000	5241	FLOOR, CONCRETE (6") REPLACE	SF	$.00
04	FL	000	5250	PAINTING, INTERIOR	SF	$.00
04	FL	000	5251	PAINTING, EXTERIOR	SF	$.00
04	FL	000	5260	HEATER, HOT WATER, REPLACE	EA	$.00

SAMPLE

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FEDERAL EMERGENCY MANAGEMENT AGENCY

G.2 - NUMERIC COST CODE

REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	5270	TABLES, LAMINATED, REPLACE	EA	$ 00
04	FL	000	5280	TABLES, CONFERENCE, REPLACE	EA	$ 00
04	FL	000	5290	DESK REPLACE	EA	$ 00
04	FL	000	5300	FILING CABINET, REPLACE	EA	$ 00
04	FL	000	5310	CHAIR REPLACE	EA	$ 00
04	FL	000	5320	REFRIGERATOR REPLACE	EA	$ 00
04	FL	000	5330	FREEZER REPLACE	EA	$ 00
04	FL	000	5331	INSULATION, R-11/R-19, WALL	SF	$ 70
04	FL	000	5332	INSULATION, BLOWN, 6" THICK	SF	$ 77
04	FL	000	5410	GUTTERS, METAL 4"	LF	$2 85
04	FL	000	5411	GUTTERS, METAL 6"	LF	$3 95
04	FL	000	5412	DOWNSPOUT, METAL 6" (W/FITTINGS)	LF	$4 00
04	FL	000	5413	DRIP EDGE, METAL	LF	$ 60
04	FL	000	5414	ROOF VENTS, MUSHROOM (FOR BLT-UP)	EA	$22 00
04	FL	000	5415	ROOF VENTS, 4" METAL ROUND	EA	$7 00
04	FL	000	5416	ROOF VENTS, TURBINE, 10" THROAT	EA	$50 00
04	FL	000	5417	ROOF VENTS, TURBINE, 12" THROAT	EA	$110 00
04	FL	000	5418	ROOF, SINGLE PLY, MECHANICAL, APPLIED W/INSULATION	SQ	$ 00
04	FL	000	5419	ROOF, SINGLE PLY, MECHANICAL, GRAVEL APPLIED	SQ	$ 00
04	FL	000	5800	REDUCTION, FLOOD INSURANCE ADJUSTMENT	LS	$ 00
04	FL	000	5900	INSURANCE PROCEEDS, DEDUCT	LS	$ 00
*** CATEGORY F ***						
04	FL	000	6010	SEWER CLEANING (UNDER 18")	LF	$3 00
04	FL	000	6011	SEWER CLEANING (18" - 36")	LF	$5 00
04	FL	000	6012	SEWER CLEANING (36" +)	LF	$9 50
04	FL	000	6020	SEWER, TV INSP	LF	$ 80
04	FL	000	6030	CATCH BASIN CLEANING	HR	$25 00
04	FL	000	6031	CATCH BASIN, REPLACE (SIZE?)	EA	$300 00
04	FL	000	6040	SEWER TAP(6"), REPLACE	EA	$500 00
04	FL	000	6041	SEWER TAP (12")	EA	$1,000 00
04	FL	000	6042	SEWER TAP (18")	EA	$1,500 00
04	FL	000	6043	SEWER TAP (24")	EA	$ 00
04	FL	000	6050	DEWATERING, DEEP WELL, BY JOB	JOB	$ 00
04	FL	000	6060	BY-PASS PUMPING (DURING CONSTRUCTION)	JOB	$ 00
04	FL	000	6070	SHEET PILING, STEEL, PULL & SALVAGE (15' DEEP 22 PSF)	SF	$6 50
04	FL	000	6071	SHEET PILING (20' DEEP 27 PSF)	SF	$7 00
04	FL	000	6072	SHEET PILING (25' DEEP 38 PSF)	SF	$8 00
04	FL	000	6080	PILING, WOOD SHEET, LEFT IN PLACE (10' DEEP)	SF	$4 75
04	FL	000	6081	SHEET PILING, WOOD (16' DEEP)	SF	$6 50
04	FL	000	6082	SHEET PILING, WOOD (20' DEEP)	SF	$7 00
04	FL	000	6090	MANHOLE, SEWER LINE (48")	EA	$98 00
04	FL	000	6091	MANHOLE, SEWER LINE (54")	EA	$120 00
04	FL	000	6092	MANHOLE, SEWER LINE (78")	EA	$159 00
04	FL	000	6093	MANHOLE, SEWER, 8' DEEP, REPLACE	EA	$2,000 00
04	FL	000	6094	MANHOLE, SEWER, 9' DEEP, REPLACE	EA	$2,500 00
04	FL	000	6095	MANHOLE COVER, STANDARD	EA	$1,000 00
04	FL	000	6100	WATER LINE, INDIVIDUAL - REMOVE AND REPLACE	EA	$120 00
04	FL	000	6110	FIRE HYDRANT ADJUSTMENT	EA	$50 00
04	FL	000	6120	FIRE HYDRANT, REPLACE	EA	$300 00
04	FL	000	6130	GATE VALVE (6")	EA	$400 00
04	FL	000	6131	GATE VALVE (8")	EA	$600 00
04	FL	000	6132	GATE VALVE (12")	EA	$1,000 00
04	FL	000	6133	GATE VALVE (16")	EA	$3,000 00
04	FL	000	6134	GATES, SHEAR (24") (MATL $2800)	EA	$4,000 00
04	FL	000	6140	SEWER LINE REPAIR 8" (0 - 10' DEPTH)	LF	$70 00
04	FL	000	6141	SEWER LINE REPAIR 8" (10' - 20')	LF	$ 00
04	FL	000	6150	SEWER LINE REPAIR 10" (0 - 10')	LF	$139 25
04	FL	000	6151	SEWER LINE REPAIR 10" (10' - 20')	LF	$336 00
04	FL	000	6160	SEWER LINE REPAIR 12" (0 - 10' DEEP)	LF	$225 00
04	FL	000	6161	SEWER LINE REPAIR 12" (10' - 20')	LF	$373 00
04	FL	000	6170	SEWER LINE REPAIR 15" (0 - 10')	LF	$ 00
04	FL	000	6171	SEWER LINE REPAIR 15" (10' - 20')	LF	$ 00
04	FL	000	6180	SEWER LINE REPAIR 18" (0 - 10' DEEP)	LF	$ 00

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G.2 - NUMERIC COST CODE

REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	6181	SEWER LINE REPAIR 18" (10' - 20')	LF	$452.00
04	FL	000	6190	SEWER LINE REPAIR 24" (0 - 10')	LF	$.00
04	FL	000	6191	SEWER LINE REPAIR 24" (10' - 20')	LF	$.00
04	FL	000	6200	EXCAVATION, STRUCTURAL	CY	$16.00
04	FL	000	6210	BACKFILL, STRUCTURAL	CY	$18.00
04	FL	000	6220	PAVEMENT REMOVAL	SY	$4.25
04	FL	000	6230	CONCRETE SIDEWALK REMOVAL	SF	$.60
04	FL	000	6240	CONCRETE CURB AND GUTTER REMOVAL	LF	$3.20
04	FL	000	6250	CONCRETE SIDEWALK (4")	SF	$3.00
04	FL	000	6260	CONCRETE CURB AND GUTTER	LF	$10.00
04	FL	000	6270	CONCRETE PAVEMENT (NO RE-BARS)	CY	$.00
04	FL	000	6280	WATER MAIN (10"), PLASTIC	LF	$.00
04	FL	000	6290	BEDDING MATERIAL UNDER PIPE	CY	$.00
04	FL	000	6300	ELECTRIC POLE, WOOD (30')	EA	$262.00
04	FL	000	6301	ELECTRIC POLE, WOOD (35')	EA	$262.00
04	FL	000	6302	ELECTRIC POLE, WOOD (40')	EA	$340.00
04	FL	000	6303	ELECTRIC POLE, WOOD (45')	EA	$340.00
04	FL	000	6304	ELECTRIC DISTR. LINES, PHASE 1, #4 ACSR WIRE	MI	$21,323.00
04	FL	000	6305	ELECTRIC DISTR. LINES, PHASE 2, #4 ACSR WIRE	MI	$25,354.00
04	FL	000	6306	ELECTRIC DISTR. LINES, PHASE 3, #4 ACSR WIRE	MI	$26,090.00
04	FL	000	6307	ELECTRIC DISTR. LINES, PHASE 3, #2 ACSR - 1/0 WIRE	MI	$32,671.00
04	FL	000	6308	ELECTRIC DISTR. LINES, PHASE 3, #2 ACSR -4/0 WIRE	MI	$36,375.00
04	FL	000	6309	ELECTRIC DISTR. LINES, PHASE 3, #2 336 WIRE	MI	$40,936.00
04	FL	000	6310	TRANSFORMERS 5 KVA (COST ONLY)	EA	$167.37
04	FL	000	6311	TRANSFORMERS 10 KVA (COST ONLY)	EA	$256.66
04	FL	000	6312	TRANSFORMERS 25 KVA (COST ONLY)	EA	$600.00
04	FL	000	6313	TRANSFORMERS 15 KVA, POLE MOUNT, IN PLACE	EA	$554.00
04	FL	000	6314	TRANSFORMERS 25 KVA, POLE MOUNT, IN PLACE	EA	$673.00
04	FL	000	6315	TRANSFORMERS 50 KVA, POLE MOUNT, IN PLACE	EA	$699.00
04	FL	000	6316	TRANSFORMERS 50 KVA, PAD MOUNT, IN PLACE	EA	$1,192.00
04	FL	000	6317	TRAFFIC SIGNAL, 1 - SECTION HEAD	EA	$120.00
04	FL	000	6318	TRAFFIC SIGNAL, 3 - SECTION HEAD	EA	$340.00
04	FL	000	6319	TRAFFIC SIGNAL, 4 - SECTION HEAD	EA	$450.00
04	FL	000	6320	TRAFFIC SIGNAL, 5 - SECTION HEAD	EA	$550.00
04	FL	000	6321	ELECTRIC MOTOR (7 ½ HP) REMOVE, DRY AND REINSTALL	EA	$290.00
04	FL	000	6322	ELECTRIC MOTOR (15 HP) REMOVE, DRY AND REINSTALL	EA	$625.00
04	FL	000	6323	ELECTRIC MOTOR (30 HP) REMOVE, DRY AND REINSTALL	EA	$750.00
04	FL	000	6330	CROSS ARMS WITH HARDWARE (4')	EA	$.00
04	FL	000	6331	CROSS ARMS WITH HARDWARE (5')	EA	$.00
04	FL	000	6332	CROSS ARMS WITH HARDWARE (6')	EA	$.00
04	FL	000	6340	ELECTRIC METERS (HOUSE),NOT INCL WEATH	EA	$40.00
04	FL	000	6350	ELECTRIC PUMP AND MOTOR REPAIR (2 HP)	EA	$245.00
04	FL	000	6351	ELECTRIC PUMP AND MOTOR (5 HP) HORIZONTAL	EA	$345.00
04	FL	000	6352	ELECTRIC PUMP AND MOTOR (10 HP)HORIZONTAL	EA	$515.00
04	FL	000	6353	ELECTRIC PUMP AND MOTOR (15 HP)HORIZONTAL	EA	$.00
04	FL	000	6354	PUMP AND MOTOR REPAIR (7.5 HP) HORIZONTAL	EA	$445.00
04	FL	000	6355	ELECTRIC PUMP AND MOTOR (25 HP) HORIZONTAL	EA	$745.00
04	FL	000	6356	ELECTRIC PUMP AND MOTOR (30 HP)HORIZONTAL	EA	$659.00
04	FL	000	6357	ELECTRIC PUMP AND MOTOR (30 HP)VERTICAL	EA	$850.00
04	FL	000	6358	ELECTRIC PUMP AND MOTOR (40 HP)HORIZONTAL	EA	$945.00
04	FL	000	6359	ELECTRIC PUMP AND MOTOR (75 HP)HORIZONTAL	EA	$1,350.00
04	FL	000	6360	ELECTRIC PUMP AND MOTOR (75 HP)VERTICAL	EA	$1,500.00
04	FL	000	6361	ELECTRIC PUMP AND MOTOR (100 HP)VERTICAL	EA	$1,800.00
04	FL	000	6410	PUMP, SUBMERSIBLE, 3 HP	EA	$500.00
04	FL	000	6411	PUMP, SUBMERSIBLE, 5 HP	EA	$600.00
04	FL	000	6412	PUMP, SUBMERSIBLE, 7.5 HP	EA	$1,100.00
04	FL	000	6413	PUMP, SUBMERS (SHOTGUN TYPE), 3 HP	EA	$1,050.00
*** CATEGORY G ***						
04	FL	000	7010	RESEED GRASSLANDS, SCARIFY, FERTILIZE	SY	$.40
04	FL	000	7011	RESEED GRASSLANDS, SCARIFY, FERTILIZE	AC	$1,960.00
04	FL	000	7012	TOP SOIL AND SEEDING (HYDR.) 2"	SY	$.20
04	FL	000	7020	TREE, REPLACE (1 ½" - 2 ½")	EA	$100.00
04	FL	000	7030	FILL ROOT CRATERS	CY	$30.00

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REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	7040	BASEBALL BACKSTOP, REPLACE	LF	$25.00
04	FL	000	7041	BASKETBALL HOOP/BACKSTOP	EA	$500.00
04	FL	000	7050	TENNIS COURT FENCE, REPLACE	LF	$12.00
04	FL	000	7051	TENNIS COURT NET	EA	$150.00
04	FL	000	7052	TENNIS COURT WIND SCREEN	SF	$.50
04	FL	000	7060	ROOF, (SMALL STRUCTURE) REPLACE, LABOR, SHEET,&ROOFING	SF	$8.00
04	FL	000	7070	BLEACHERS, GRANDSTAND, REPLACE	LF	$1.00
04	FL	000	7071	BLEACHERS, ALUM, 3-ROW SEATS, 15'	EA	$500.00
04	FL	000	7072	BLEACHERS, ALUM, 5-ROW SEATS, 15'	EA	$830.00
04	FL	000	7073	BLEACHERS, ALUM, 6-ROW	EA	$2.25
04	FL	000	7074	BLEACHERS, 10-ROW, REQUIRE SAFETY BACKS, ETC.)	EA	$2,210.00
04	FL	000	7079	FENCE, 4' CHAINLINK, REPLACE, 9 GAUGE	LF	$4.75
04	FL	000	7080	FENCE, 5' CHAINLINK, REPLACE	LF	$5.50
04	FL	000	7081	FENCE, 6' CHAINLINK, REPLACE	LF	$6.00
04	FL	000	7082	FENCE, 8' CHAINLINK, REPLACE	LF	$8.00
04	FL	000	7083	FENCE, 10' CHAINLINK, REPLACE	LF	$12.00
04	FL	000	7084	FENCE, REMOVAL	LF	$1.50
04	FL	000	7085	FENCE, 6' W/BARBED WIRE STRAND	LF	$6.75
04	FL	000	7086	FENCE, 12' CHAINLINK, REPLACE	LF	$15.00
04	FL	000	7090	GATE, CHAINLINK 5', 6' HIGH	EA	$85.00
04	FL	000	7091	GATE, CHAINLINK, 6'	EA	$100.00
04	FL	000	7092	GATE, CHAINLINK, 8'	EA	$125.00
04	FL	000	7093	GATE, CHAINLINK, 10'	EA	$150.00
04	FL	000	7100	PICNIC TABLE, CONCRETE, REPLACE	EA	$125.00
04	FL	000	7101	BENCH, PARK (STEEL FRAME/WOOD 10')	EA	$325.00
04	FL	000	7110	TRASH BARREL, REPLACE, $15 TO $150	EA	$.00
04	FL	000	7111	TRASH CONTAINER, 46.4 GAL	EA	$34.00
04	FL	000	7120	SWING SET (8' HIGH 4 SEAT), REPLACE	EA	$1,154.00
04	FL	000	7130	SLIDE SET (12' LONG 6' HIGH), REPLACE	EA	$761.00
04	FL	000	7140	GRILL, OUTDOOR, REPLACE	EA	$79.00
04	FL	000	7150	DOCK, WOOD PILE SUPPORT (2" DECK)	SF	$.00
04	FL	000	7160	DOCK, FLOATING (PREFAB)	SF	$.00
04	FL	000	7161	PIERS, STRINGER 2"X12"	MBF	$1,000.00
04	FL	000	7162	PIERS, DECKING 2"x8"	MBF	$1,000.00
04	FL	000	7163	PIERS, POSTS 4"X4"	MBF	$555.00
04	FL	000	7164	PIERS, HANDRAIL, GALV. STEEL 1"	LF	$6.00
04	FL	000	7165	PIERS, METAL STRAPPING(TIEDOWNS)	LF	$1.98
04	FL	000	7166	PIER PILINGS, REPLACE(LOW WATER)	LF	$.00
04	FL	000	7167	PIER PILING, REPLACE(HIGH WATER)16' AVG	LF	$23.00
04	FL	000	7170	SOD, REPLACE	SY	$2.00
04	FL	000	7171	GOLF GREEN, REPLACE	EA	$1,000.00
04	FL	000	7180	POSTS, GUARD (4" WOOD) REPLACE	EA	$.00
04	FL	000	7181	WHEEL STOPS, CONC., 6 ½', X 6"	EA	$19.00
04	FL	000	7190	TOILET VAULTS, PUMP OUT	EA	$.00
04	FL	000	7200	SIGNS, WOOD (PAINTED LETTERS)	SF	$.00
04	FL	000	7210	SIGNS, WOOD (ROUTERED LETTERS)	SF	$.00
04	FL	000	7220	STONE DUST (FOR BASEBALL DIAMONDS)	CY	$.00
04	FL	000	7221	WALL, CONCRETE BLOCK, 5-10' HIGH	SF	$2.80
04	FL	000	7300	FENCE, 4' CHAINLINK, REPAIR	LF	$2.00
04	FL	000	7301	FENCE, 5, CHAINLINK, REPAIR	LF	$3.50
04	FL	000	7302	FENCE, 6' CHAINLINK, REPAIR	LF	$5.00
04	FL	000	7303	FENCE, 10, CHAINLINK, REPAIR	LF	$5.00
04	FL	000	7304	FENCE, 12, CHAINLINK, REPAIR	LF	$6.00
04	FL	000	7305	FENCE, LINE POST, 1-5/8"	EA	$.75
04	FL	000	7306	FENCE, LINE POST 2-1/2"	EA	$.80
04	FL	000	7308	FENCE, TOP RAIL (FOR CHAINLINK), 1-1/4"	LF	$1.25
04	FL	000	7309	FENCE, BOARD, REPLACE 6'	LF	$8.42
04	FL	000	7310	FENCE, BARBED WIRE, 4-PRONG	LF	$.06
04	FL	000	7311	FENCE, BARBED, 4-PRONG	LF	$.60
04	FL	000	7315	POST 2 ½" FOR 6' CHAINLINK	EA	$7.25
04	FL	000	7410	PIERS, STRINGER 2"X12"	MBF	$1,000.00
04	FL	000	7411	PIERS, DECKING 2"X8"	MBF	$1,000.00
04	FL	000	7412	PIERS, POSTS 4"X4"	MBF	$555.00
04	FL	000	7413	PIERS, HANDRAIL, GALV. STEEL 1"	LF	$6.00
04	FL	000	7414	PIERS, METAL STRAPPING (TIEDOWNS)	LF	$1.98

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REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	7415	PIER PILING, REPLACE	LF	$.00
04	FL	000	7416	PIER PILING, REPLACE AVG 16'	LF	$23.00
04	FL	000	7417	PIER PILING, RESET	LF	$.00
04	FL	000	7418	PIER PILING, RESET	LF	$.00
04	FL	000	7510	LIGHT POLES, TREATED, CLASS #3, 25'	EA	$195.00
04	FL	000	7511	LIGHT POLE, TREATED, 30'	EA	$262.00
04	FL	000	7512	LIGHT POLE, TREATED, 35'	EA	$262.00
04	FL	000	7513	LIGHT POLE, TREATED, 40'	EA	$340.00
04	FL	000	7514	LIGHT POLE, TREATED, 45'	EA	$340.00
04	FL	000	7515	LIGHT POLE, TREATED, 50'	EA	$415.00
04	FL	000	7516	LIGHT POLE, TREATED, 55'	EA	$488.00
04	FL	000	7517	LIGHT POLE, TREATED, 60'	EA	$$50.00
04	FL	000	7518	LIGHT POLE, TREATED, 70'	EA	$750.00
04	FL	000	7519	LIGHT POLE, TREATED, 80'	EA	$900.00
04	FL	000	7520	LIGHT POLE, TREATED, 90'	EA	$1,439.00
04	FL	000	7530	LIGHTING, RE-AIM, (# LITS PER POLE)	EA	$.00
04	FL	000	7531	LIGHTING, RE-AIM 1-4 LIGHTS/POLE	EA	$40.00
04	FL	000	7532	LIGHTING, RE-AIM 5-8 LIGHTS/POLE	EA	$65.00
04	FL	000	7533	LIGHTING, RE-AIM 9-12 LIGHTS/POLE	EA	$100.00
04	FL	000	7534	LIGHTING, RE-AIM 13-16 LIGHTS/POLE	EA	$120.00
04	FL	000	7535	LIGHTING, RE-AIM 17-24 LIGHTS/POLE	EA	$150.00
04	FL	000	7536	LIGHTING, RE-AIM 25-32 LIGHTS/POLE	EA	$170.00
04	FL	000	7537	LIGHTING, RE-AIM 33 OR MORE	EA	$200.00
04	FL	000	7538	LIGHT, METAL HALIDE FLOOD, 1500	EA	$311.00
04	FL	000	7539	LIGHTING, LENS COVER	EA	$35.00
04	FL	000	7540	LIGHTING, 400 WATT SODIUM FIXTURE	EA	$350.00
04	FL	000	7550	SEA OATS (18" OC) 60' WIDE AVG	EA	$1.23
04	FL	000	7999	APPRVD HAZARD MITIGATION PROPOSAL	LS	$.00
*** FEMA EQUIPMENT RATE ***						
04	FL	000	8010	AIR COMPRESSOR TO 150 CFM	HR	$4.50
04	FL	000	8011	AIR COMPRESSOR TO 225 CFM	HR	$7.00
04	FL	000	8012	AIR COMPRESSOR TO 325 CFM	HR	$11.50
04	FL	000	8013	AIR COMPRESSOR TO 450 CFM	HR	$13.00
04	FL	000	8014	AIR COMPRESSOR TO 600 CFM	HR	$20.00
04	FL	000	8020	AMBULANCE	MI	$.33
04	FL	000	8030	AUTOMOBILE	MI	$.30
04	FL	000	8040	BOAT TO 50 HP	HR	$8.00
04	FL	000	8041	BOAT TO 75 HP	HR	$11.50
04	FL	000	8042	BOAT TO 100 HP	HR	$13.50
04	FL	000	8050	BROOM, SELF PROP TO 85 HP	HR	$7.75
04	FL	000	8060	BROOM, TOWED W/ POWER	HR	$3.00
04	FL	000	8070	BROOM, TOWED	HR	$1.50
04	FL	000	8080	BRUSH CHIPPER TO 65 HP	HR	$4.75
04	FL	000	8081	BRUSH CHIPPER TO 101 HP	HR	$8.50
04	FL	000	8082	BRUSH CHIPPER TO 156 HP	HR	$13.00
04	FL	000	8090	BUS TO 16 PASS	MI	$.33
04	FL	000	8091	BUS OV 16 PASS	MI	$.47
04	FL	000	8100	CHAIN SAW	HR	$1.2504
	FL	000	8110	CLAM/DRAGLINE TO 1.00 CY	HR	$34.00
04	FL	000	8111	CLAM/DRAGLINE TO 1.25 CY	HR	$41.00
04	FL	000	8112	CLAM/DRAGLINE TO 1.50 CY	HR	$49.00
04	FL	000	8113	CLAM/DRAGLINE TO 2.00 CY	HR	$61.00
04	FL	000	8120	COMPACTOR, HAND HELD TO 5 HP	HR	$1.50
04	FL	000	8121	COMPACTOR, HAND HELD TO 12 HP	HR	$4.00
04	FL	000	8130	CRANE TO 5 TN	HR	$17.00
04	FL	000	8131	CRANE TO 10 TN	HR	$24.00
04	FL	000	8132	CRANE TO 20 TN	HR	$39.00
04	FL	000	8133	CRANE TO 30 TN	HR	$52.00
04	FL	000	8134	CRANE TO 45 TN	HR	$56.00
04	FL	000	8135	CRANE TO 50 TN	HR	$61.00
04	FL	000	8140	DREDGE TO 160 HP	HR	$27.00
04	FL	000	8141	DREDGE TO 240 HP	HR	$32.00
04	FL	000	8150	HYDRAULIC EXCAVATOR TO 0.50 CY	HR	$23.00

SAMPLE

DATE: 09/06/95
TIME: 08:50AM

FEDERAL EMERGENCY MANAGEMENT AGENCY

G.2 - NUMERIC COST CODE

REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	8151	HYDRAULIC EXCAVATOR TO 1.00 CY	HR	$30.00
04	FL	000	8152	HYDRAULIC EXCAVATOR TO 1.25 CY	HR	$32.00
04	FL	000	8153	HYDRAULIC EXCAVATOR TO 1.50 CY	HR	$43.00
04	FL	000	8154	EXCAVATOR, HYDRAULIC (1) TO 2.00 CY	HR	$68.00
04	FL	000	8170	FORK LIFT TO 50 HP	HR	$6.00
04	FL	000	8171	FORK LIFT TO 80 HP	HR	$12.00
04	FL	000	8200	GENERATOR TO 5 HP	HR	$1.00
04	FL	000	8201	GENERATOR TO 11 HP	HR	$1.00
04	FL	000	8202	GENERATOR TO 21 HP	HR	$3.75
04	FL	000	8203	GENERATOR TO 25 HP	HR	$5.50
04	FL	000	8204	GENERATOR TO 50 HP	HR	$8.00
04	FL	000	8205	GENERATOR TO 75 HP	HR	$10.50
04	FL	000	8206	GENERATOR TO 100 HP	HR	$12.00
04	FL	000	8207	GENERATOR (2) TO 150 HP	HR	$15.00
04	FL	000	8208	GENERATOR (2) TO 200 HP	HR	$26.00
04	FL	000	8220	GRADER, MOTOR TO 35 HP	HR	$5.25
04	FL	000	8221	GRADER, MOTOR TO 75 HP	HR	$13.00
04	FL	000	8222	GRADER, MOTOR TO 100 HP	HR	$21.00
04	FL	000	8223	GRADER, MOTOR TO 135 HP	HR	$23.00
04	FL	000	8224	GRADER, MOTOR TO 155 HP	HR	$26.00
04	FL	000	8225	GRADER, MOTOR TO 187 HP	HR	$26.00
04	FL	000	8226	GRADER, MOTOR TO 210 HP	HR	$31.00
04	FL	000	8227	GRADER, MOTOR TO 250 HP	HR	$47.00
04	FL	000	8228	GRADER, MOTOR TO 275 HP	HR	$60.00
04	FL	000	8240	LOADER, CRAWLER TO 0.75 CY	HR	$10.50
04	FL	000	8241	LOADER, CRAWLER TO 1.00 CY	HR	$13.00
04	FL	000	8242	LOADER, CRAWLER TO 1.50 CY	HR	$16.50
04	FL	000	8243	LOADER, CRAWLER TO 2.00 CY	HR	$23.00
04	FL	000	8244	LOADER, CRAWLER TO 2.25 CY	HR	$29.00
04	FL	000	8245	LOADER, CRAWLER TO 2.75 CY	HR	$39.00
04	FL	000	8246	LOADER, CRAWLER TO 3.50 CY	HR	$55.00
04	FL	000	8247	LOADER, CRAWLER TO 4.50 CY	HR	$53.00
04	FL	000	8260	LOADER, WHEELED TO 0.25 CY	HR	$6.00
04	FL	000	8261	LOADER, WHEELED TO 0.50 CY	HR	$7.50
04	FL	000	8262	LOADER, WHEELED TO 1.00 CY	HR	$11.00
04	FL	000	8263	LOADER, WHEELED TO 1.50 CY	HR	$16.00
04	FL	000	8264	LOADER, WHEELED TO 2.00 CY	HR	$16.00
04	FL	000	8265	LOADER, WHEELED TO 2.50 CY	HR	$20.00
04	FL	000	8266	LOADER, WHEELED TO 3.00 CY	HR	$23.00
04	FL	000	8267	LOADER, WHEELED TO 4.00 CY	HR	$31.00
04	FL	000	8268	LOADER, WHEELED TO 4.50 CY	HR	$36.00
04	FL	000	8269	LOADER, WHEELED TO 5.00 CY	HR	$41.00
04	FL	000	8280	MIXER, CONCRETE TO 8 HP	HR	$1.25
04	FL	000	8285	CONCRETE, FLOOR TROWEL TO 8 HP	HR	$1.00
04	FL	000	8290	CONCRETE MIXER, TRANSIT TO 235 HP	HR	$35.00
04	FL	000	8291	CONCRETE MIXER, TRANSIT TO 285 HP	HR	$38.00
04	FL	000	8300	PAVER TO 44 HP	HR	$9.00
04	FL	000	8301	PAVER TO 96 HP	HR	$27.00
04	FL	000	8302	PAVER TO 260 HP	HR	$46.00
04	FL	000	8306	PAVEMENT BREAKER TO 75 HP	HR	$12.00
04	FL	000	8307	PAVEMENT BREAKER TO 150 HP	HR	$29.00
04	FL	000	8310	PLOW, MOUNTED	HR	$2.50
04	FL	000	8320	PUMP TO 1.5 IN	HR	$1.00
04	FL	000	8321	PUMP TO 2.0 IN	HR	$1.25
04	FL	000	8322	PUMP TO 3.0 IN	HR	$1.50
04	FL	000	8323	PUMP TO 4.0 IN	HR	$2.50
04	FL	000	8324	PUMP TO 6.0 IN	HR	$8.00
04	FL	000	8325	PUMP TO 8.0 IN	HR	$9.00
04	FL	000	8326	PUMP TO 10.0 IN	HR	$10.00
04	FL	000	8327	PUMP TO 12.0 IN	HR	$14.50
04	FL	000	8340	PUMP, W/O POWER TO 16 IN	HR	$.50
04	FL	000	8341	PUMP, W/O POWER TO 20 IN	HR	$1.00
04	FL	000	8342	PUMP, W/O POWER TO 24 IN	HR	$1.25
04	FL	000	8350	ROLLER, STATIC TO 58 HP	HR	$6.50
04	FL	000	8351	ROLLER, STATIC TO 96 HP	HR	$13.00

SAMPLE

DATE: 09/06/95
TIME: 08:50AM

FEDERAL EMERGENCY MANAGEMENT AGENCY

G.2 - NUMERIC COST CODE

REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	8352	ROLLER, STATIC TO 114 HP	HR	$16.00
04	FL	000	8353	ROLLER, STATIC TO 150 HP	HR	$22.00
04	FL	000	8360	ROLLER, TOWED EA DRUM	HR	$.75
04	FL	000	8370	SAW, CONCRETE TO 18 HP	HR	$2.25
04	FL	000	8371	SAW, CONCRETE TO 65 HP	HR	$7.00
04	FL	000	8380	SCRAPER TO 11 CY	HR	$43.00
04	FL	000	8381	SCRAPER TO 16 CY	HR	$56.00
04	FL	000	8382	SCRAPER TO 23 CY	HR	$72.00
04	FL	000	8390	SCRAPER, TOWED TO 9 CY	HR	$13.00
04	FL	000	8391	SCRAPER, TOWED TO 12 CY	HR	$14.00
04	FL	000	8392	SCRAPER, TOWED TO 18 CY	HR	$18.00
04	FL	000	8400	SPREADER, TLGATE TO 7 HP	HR	$1.00
04	FL	000	8410	SWEEPER, PICK-UP TO 95 HP	HR	$20.00
04	FL	000	8411	SWEEPER, PICK-UP TO 175 HP	HR	$23.00
04	FL	000	8420	TRACTOR, CRAWLER TO 42 HP	HR	$9.50
04	FL	000	8421	TRACTOR, CRAWLER TO 67 HP	HR	$13.50
04	FL	000	8422	TRACTOR, CRAWLER TO 78 HP	HR	$16.00
04	FL	000	8423	TRACTOR, CRAWLER TO 110 HP	HR	$21.00
04	FL	000	8424	TRACTOR, CRAWLER TO 165 HP	HR	$30.00
04	FL	000	8425	TRACTOR, CRAWLER TO 210 HP	HR	$44.00
04	FL	000	8426	TRACTOR, CRAWLER TO 310 HP	HR	$58.00
04	FL	000	8440	TRACTOR, WHEELED TO 50 HP	HR	$5.00
04	FL	000	8441	TRACTOR, WHEELED TO 83 HP	HR	$6.50
04	FL	000	8442	TRACTOR, WHEELED TO 134 HP	HR	$17.00
04	FL	000	8443	TRACTOR, WHEELED TO 186 HP	HR	$28.00
04	FL	000	8444	TRACTOR, WHEELED TO 215 HP	HR	$38.00
04	FL	000	8460	TRAILER, DUMP TO 20 CY	HR	$6.25
04	FL	000	8461	TRAILER, DUMP TO 24 CY	HR	$7.50
04	FL	000	8462	TRAILER, DUMP TO 33 CY	HR	$8.00
04	FL	000	8463	TRAILER, DUMP TO 12 CY	HR	$5.50
04	FL	000	8480	TRAILER, EQUIP TO 10 TN	HR	$2.00
04	FL	000	8481	TRAILER, EQUIP TO 20 TN	HR	$2.75
04	FL	000	8482	TRAILER, EQUIP TO 30 TN	HR	$4.75
04	FL	000	8483	TRAILER, EQUIP TO 40 TN	HR	$5.50
04	FL	000	8484	TRAILER, EQUIP TO 50 TN	HR	$8.50
04	FL	000	8490	TRAILER, LIQUID TO 3000 GAL	HR	$10.00
04	FL	000	8491	TRAILER, LIQUID TO 5000 GAL	HR	$12.00
04	FL	000	8492	TRAILER, LIQUID TO 10000 GAL	HR	$16.00
04	FL	000	8500	TRAILER OFFICE	DY	$5.00
04	FL	000	8510	TRENCHER TO 36 HP	HR	$6.50
04	FL	000	8511	TRENCHER TO 64 HP	HR	$9.75
04	FL	000	8512	TRENCHER TO 94 HP	HR	$15.00
04	FL	000	8513	TRENCHER TO 113 HP	HR	$25.00
04	FL	000	8514	TRENCHER TO 160 HP	HR	$42.00
04	FL	000	8520	TRUCK, PICKUP TO 0 5 TN	MI	$.30
04	FL	000	8521	TRUCK TO 130 HP	HR	$7.50
04	FL	000	8522	TRUCK TO 130 HP	MI	$.00
04	FL	000	8523	TRUCK TO 4 CY TO 150 HP	HR	$13.00
04	FL	000	8524	TRUCK TO 6 CY TO 175 HP	HR	$13.00
04	FL	000	8525	TRUCK TO 8 CY TO 190 HP	HR	$16.00
04	FL	000	8526	TRUCK TO 10 CY TO 250 HP	HR	$24.00
04	FL	000	8527	TRUCK TO 12 CY TO 275 HP	HR	$24.00
04	FL	000	8528	TRUCK OV 12 CY TO 400 HP	HR	$28.00
04	FL	000	8530	TRUCK TO 1 TN	MI	$.31
04	FL	000	8531	TRUCK TO 1 TN	HR	$9.50
04	FL	000	8532	TRUCK TO 3 TN	HR	$11.00
04	FL	000	8550	WELDER TO 15 HP	HR	$2.00
04	FL	000	8551	WELDER TO 32 HP	HR	$5.00
04	FL	000	8552	WELDER TO 56 HP	HR	$7.00
*** OTHER ***						
00	00	000	9007	LABOR	LS	$.00
00	00	000	9008	EQUIPMENT	LS	$.00
00	00	000	9009	MATERIAL	LS	$.00

SAMPLE

DATE: 09/06/95
TIME: 08:50AM

FEDERAL EMERGENCY MANAGEMENT AGENCY

G.2 - NUMERIC COST CODE

REG	STATE	CNTY	COST CODE NUMBER	DESCRIPTION	UNIT OF MEASURE	UNIT PRICE
04	FL	000	9010	LABORER, REGULAR TIME	HR	$.00
04	FL	000	9011	LABORER, OVERTIME	HR	$.00
04	FL	000	9012	EQUIPMENT OPERATOR, REGULAR TIME	HR	$.00
04	FL	000	9013	EQUIPMENT OPERATOR, OVERTIME	HR	$.00
04	FL	000	9014	WORKING FOREMAN, REGULAR TIME	HR	$.00
04	FL	000	9015	WORKING FOREMAN, OVERTIME	HR	$.00
04	FL	000	9016	EXTRA HIRE, W/PAYROLL ADDITIVES, REGULAR TIME	HR	$.00
04	FL	000	9017	EXTRA HIRE, W/PAYROLL ADDITIVES, OVERTIME	HR	$.00
04	FL	000	9018	FIREFIGHTERS, OVERTIME	HR	$.00
04	FL	000	9019	POLICE, OVERTIME	HR	$.00
04	FL	000	9020	DISPATCHER, OVERTIME	HR	$.00
04	FL	000	9021	CONTRACT LABOR	HR	$.00
04	FL	000	9022	LABOR	LS	$.00
04	FL	000	9023	EQUIPMENT	LS	$.00
04	FL	000	9024	MATERIAL	LS	$.00
04	FL	000	9025	CONTRACT	LS	$.00
04	FL	000	9030	RENTED EQUIPMENT	LS	$.00
04	FL	000	9999			

SAMPLE

FLORIDA STATUES 235.026(9)

EDUCATIONAL FACILITIES AS EMERGENCY SHELTERS

F.S. 235.026(9) EDUCATION FACILITIES AS EMERGENCY SHELTERS.—
(a) The Department of Education shall, in consultation with boards and county and state emergency management offices, amend the State Uniform Building Code for Public Educational Facilities Construction to incorporate public shelter design criteria into the Uniform Building Code. The new criteria must be designed to ensure that appropriate core facility areas in new educational facilities can serve as public shelters for emergency management purposes. The State Board of Education shall publish proposed amendments to the State Uniform Building Code for Public Educational Facilities Construction setting forth the public-shelter criteria by July 1, 1995. A facility, or an appropriate core facility area within a facility, for which a design contract is entered into subsequent to the effective date of the inclusion of the public shelter criteria in the code must be built in compliance with the amended code unless the facility or a part thereof is exempted from using the new shelter criteria due to its location, size, or other characteristics by the applicable board with the concurrence of the applicable local emergency management agency or the Department of Community Affairs. Any educational facility located or proposed to be located in an identified category 1, 2, or 3 evacuation zone shall not be subject to the requirements of this subsection. If more than one educational facility is being constructed within any 3-mile radius, no more than one facility, which shall be selected on the basis of cost-effectiveness and greatest provision of shelter space, shall be required to incorporate the public shelter criteria into its construction.
(b) By January 31, 1996, and January 31 every even-numbered year thereafter, the Department of Community Affairs shall prepare and submit a statewide emergency shelter plan to the Governor and the Cabinet for approval. Such plan shall identify the general location and square footage of existing shelters, by county, and the general location and square footage of needed shelters, by county, in the next 5 years. Such plan shall identify the types of public facilities which should be constructed to comply with emergency shelter criteria and recommend an appropriate, adequate, and dedicated source of funding for the additional cost of constructing emergency shelters within these public facilities. 2 After the approval of the plan, no board shall be required to build more emergency shelter space than identified as needed in the plan and decisions pertaining to exemptions pursuant to paragraph (a) shall be guided by the plan and the provisions of this subsection.

- **It took five days for Dade County Public Schools to get a damage assessment team in place after the hurricane.**
- **Hurricane damage assessment teams took 4 ½ days to survey Dade County School Board Facilities**
- **Communications**
  - Communications were out for several days
  - Communication systems using repeater towers were down until towers could be reestablished
- **Failures due to**:
  - Wind or flying debris breaching school exterior
    - Primary cause of damage to schools
    - Winds passed through structure and penetrated it at it's weakest point.
    - Breaching of schools was observed only at facilities whose openings which were not protected by metal louvers.
  - Roof edge design
    - Second most important cause of damage to schools
    - Caused roof material to peel away or tear
      - Exposed roof and interior to damage
      - Zipper effect
  - Loss of roof top equipment or flying debris
    - Third most important cause of damage to schools
    - Fell on roof puncturing roof membrane
    - Equipment than fell off roof
    - Impact loads
  - Installation/detailing
    - Bonding/attachments
    - One weakness may lead to more extensive damage and progressive failure of the building
  - Wind load exceeds design standards
- **Water saturated insulation**
  - Contributed in the collapse of ceilings
  - Soaked batt insulation stained objects it came in contact with
- **Doors & windows**
  - Wood doors & frames swelled
  - Roll up doors failed on windward side
    - Lead to increased internal pressure and subsequent failure of roofs and/or walls due to combined external and internal pressures
  - Metal mesh window coverings did not protect windows from flying debris
  - Integral shutters on windows provided good protection from wind blown debris and protected the integrity of the interior spaces.
    - Were also valuable in deterring looters.
- **Roofs**
  - Vertical uplift forces lift roof off of walls
    - Continuous load path required between roof & foundation
  - Order of survival of roof types:
    - Built-up roof (best)
    - Single ply adhered
    - Single ply mechanically attached
    - Standing seam metal
  - Built up roof systems
    - Gravel blew off or piled up at ends

Roofs (continued)

- Membrane was torn from flying debris or equipment
- Roofs over insulating materials commonly failed
  - Lightweight concrete
  - Fiber board
  - Foam
  - Insulation delaminated from deck and allowed roof system to lift
    - Insulation not fastened securely to the structural deck
- High wind passing over a parapet wall created a suction effect, lifting off roof system
- BUR re-roofs over existing BUR had same effect

- Single ply systems
  - Peeled up
  - Attachment to deck failed according to different causes
  - Membrane was torn from flying debris or equipment
  - Fully adhered work o.k.
  - Mechanically fastened failed
- Asphalt shingle roof failures
  - Not inherently strong enough to withstand hurricane force winds
  - Related to tear through at fasteners
  - Shingle tear through more prone at staples than nails
- Concrete tiles
  - Flat tiles appeared to have better resistance to blow off than barrel tile
    - Flat concrete tile has reduced exposure at edges to wind uplift
    - Holes for fasteners were not used
  - Showed no adhesion of cement mortar bedding to back of tile
    - Insufficient mortar used
    - Mortar was too dry or "dead" when used
    - Tiles not sufficiently dampened before setting
    - Nails not used to anchor tiles
    - Mortar stuck well to roof deck
    - Mortar adhered better to clay roof tiles
  - Concrete tile survived better when fully embedded in mortar
  - Concrete tiles were cause of projectile damage to neighboring structures & vehicles
- Metal roofing
  - Failed at attachment to framing
    - Failed around welds or by pull-through at fasteners
    - Fastening system inadequate to resist high winds
    - Metal clips & furring strips remained attached to roof decks or framing
- Metal decking over bar joist - failure caused by/at
  - Unanticipated internal pressures caused by breaching of building envelope
  - Inadequate connection of bar joist to their supports
  - Inadequate connection of metal deck to bar joist in regard to uplift
  - Non-load bearing end wall
    - Connections not adequate to resist shear loads between

Roofs (continued)

diaphragm and shear walls
- Direct tension force resulting from outward pull of internal pressure and external suction on the wall
- Connectors
  - Screw failures when deck pulled over screw heads
  - Welds failures by cracking
- Minimum attachment of metal roof deck to supporting walls
  - Minimized effectiveness of metal roofing to act as a diaphragm for structure
  - Allowed building failure from collapse of supporting walls
- Gymnasium roof, Miami-Dade Community College, South Campus
  - August 24, 1993, 2 PM roof collapses
    - Due to harmonic motion
    - Metal deck with rigid insulation
  - Was used as a shelter, people moved to other areas of campus
- Precast & prestressed roof systems
  - Failure rate small
  - Failure associated with loss of doors at large openings on windward wall of building

- Flashing
  - Flashing was not properly anchored to structural portion of roof
    - Hold down clips were absent
  - Wind curled the strip up and roof failure became imminent
  - Skylights
    - Most failed
  - Roof drain covers should be locked down
    - They become missiles during storm
  - Stucco or plaster on metal furring overhangs and soffits did not survive in devastated areas
- **Wall failures**
  - Non-load bearing interior partitions
    - Failed after wind forces reached interior of structure
    - Light-gage steel framing - Heads of fasteners at top & bottom plates pulled through under applied load
  - Walls supported by pre-cast concrete T-beam panel roof decks
    - Insufficient number of welded connections between roof deck and non-load bearing walls to withstand wind loads
    - Wall collapse inward or outward if the structure was pressurized by wind forces after the windows and/or doors failed
  - Brick veneer
    - Failure of brick veneer over masonry walls
      - Due to inadequacy of structural ties or mortar bonding systems used to attach brick veneer to wall
  - Masonry walls
    - Performed well
    - Failures attributed to lack in lateral bracing caused by loss of absence of competent diaphragm support
    - 4" decorative block failed
  - Sandwich panel systems
    - Channel mullions blew into the interior

- **Pre-engineered buildings**
  - Many were extensively damaged
- **Relocatables**
  - Fewer than anticipated were destroyed
- **Accessories**
  - Vent louvers and screens were blown out of walls due to insufficient anchorage
- **Cooling towers**
  - Destroyed by flying debris
- **Power outages**
  - Extended well beyond area of major damage
    - Some areas were without power for more than a month
  - Poles
    - Both concrete and wood poles failed in areas experiencing strongest winds

- **Wind force**
  - Strongest force occurred in suction
    - Roofs & windows lifted up and off
    - Roofs & windows were sucked out
  - Wind damage due to inadequate connections within the structure
- **Building**
  - Structural system only as strong as it's weakest link
  - Foundation system
    - Slab-on-grade systems are unfit for coastal areas
      - Demolished by wave force
      - Lifted up by flood waters and washed away
  - Siding failures
    - Due to improper selection without regard to their ability to resist suction or wind load
  - Conventional gable ends inadequate to resist hurricane force winds
  - Roof
    - Damage result of:
      - Aged roof materials
      - Poor maintenance
      - Poor roof covering installation practices
      - Inadequate sized fasteners for hurricane wind loads
    - Current design of many roofing systems are inadequate to resist hurricane force winds
  - Traditional historic structures survived because of:
    - Working shutters
    - High pitched or hip roofs
    - Short span roofs
    - No overhangs
    - Elevated first floors
  - Many of the buildings that collapsed in South Carolina met the prescriptive requirements in the building code.
- **76 of 80 Sewer lift stations were knocked out because of lack of emergency power (generator)**
- **Demonstrated the great need for better training and education about the known phenomena, behavior, procedures, and needs common during and after a major disaster.**
- **Hugo related deaths could have been avoided through education of the p blic about:**
  - Hazards of power outages
    - Electrocution
    - Use of candles
    - Uses of open flames
  - Need to evacuate mobile homes
  - Hazards of boating during high winds
  - Injuries during disaster cleanup
    - Familiarity with equipment being used
  - Avoiding exacerbation of medical conditions by becoming fatigued, stressed, or separated from needed medical support
  - Electrical education to emphasize hazards of:
    - Downed electrical lines
    - "Feedback" energy from emergency generators in presumably de-energized lines
    - Metal objects near utility lines

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Tallahassee, Florida
June 30, 1997
Frank T. Brogan, Commissioner